# THE BRICKBUILDER

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### LETTERPRESS

JOHN MERVEN CARRÈRE

# THE BRICKBUILDER

VOL. XX. NO. 3. MARCH, 1911.

## John Merven Carrère

IT IS only when such a commanding figure as John M. Carrère has passed out of his profession that its members are brought to a realization of what he stood for and what a position he had achieved. When we consider what was still before him in the natural course of his career, our regret at his untimely end is intensified.

I first knew Carrère when he and his future partner Hastings came into the office of McKim, Mead & White on their return from the Beaux Arts in October, 1883. He remained with us for two years as one of a group of young draftsmen, many of whom have since achieved distinction. Carrère, with his Gallic nature, was full of enthusiasm and ambition — not the ambition to remain a draftsman, but to get out into the world as the master of his own work. The opportunity came early in the commission from Mr. Flagler for the Ponce de Leon Hotel at St. Augustine, and the consequent formation of the firm of Carrère & Hastings. The opportunity seemed to me a dangerous one for men just starting in their profession; but the result stands to-day as a justification of the confidence reposed in them.

I need not say anything of his career since that time — it is an open book, known to all. I had always kept up intimate personal relations with him and watched with interest his gradual development, not only as an architect, but as a man of influence. If, apart from his architectural work I should single out one trait of his character which more than any other impressed itself upon me, it would be the valuable services which he has rendered to his profession by his work and untiring energy in anything and everything which would advance its standing. He showed his public spirit by the large part which he took in problems of civic improvement, both in his home city and elsewhere throughout the country. As a member and officer of the American Institute of Architects and of the New York Chapter of the A. I. A., as a founder and important factor in the Beaux Arts Society and as a Trustee of the American Academy in Rome, he was ever ready to work for these institutions and always found time to devote to them. His work was always full of enthusiasm and his judgment was invaluable. My last interview with Carrère was only two days before the accident, when in the midst of all his arrangements for getting away, he found time to call upon me to discuss his visit to Rome and what he might be able to do for the American Academy while there — showing once more his devotion to everything which tended to the advancement of art education.

In the death of Carrère the profession of architecture has lost a member whose place cannot be filled.

WILLIAM RUTHERFORD MEAD.

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IT IS now nearly thirty-five years since I first met John Carrère. It was on one of the steamers crossing the Atlantic to New York; I was returning from the École des Beaux-Arts where I had been for several years, and he was on the point of going abroad to study architecture. This almost casual acquaintance was destined to ripen into a long and firm friendship. We had naturally much to say to each other; he was undecided where he should go to pursue his studies, and I naturally advised Paris — and to Paris he went; and that is why, as I am fond of remembering, he used smilingly to speak of me as his architectural godfather.

When he came back from Paris six or seven years later, we renewed our acquaintance; and it is a great pleasure for me to think that during all the years that followed we became ever closer friends, and that we learned mutually to turn to each other for counsel, for advice and for sympathy in all our architectural career. I recall many visits when Carrère & Hastings, the youngest of the profession, were designing the hotel in St. Augustine, and the impression of individuality and personality that I had then of the work that the enthusiastic pair were doing. And this individual force was always one of the characteristics of Carrère; however large was the army of draftsmen that he commanded, you were always conscious of his personality in whatever was done, directing, restraining and guiding. He was always first and foremost the architect; and never a mere solicitor of work, or a social light who incidentally built houses for his friends.

This is no place to attempt any description or criticism of the many notable achievements with which he was so closely identified, and which all of us architects know so well. We note in them from time to time those changes in the point of view which come from increasing years and added experience, and which are common to nearly every one of us. But through it all is still to be found the same personal note, however varied in its expression; so that when a number of competitive drawings were exhibited it was generally quite possible to make a shrewd guess as to which one was by Carrère & Hastings. And in whatever Carrère had a hand, there was nearly always a great impression of completeness in the idea; if it were a country house, the setting and the surroundings were studied as carefully as the house itself, and the same was true of more monumental structures.

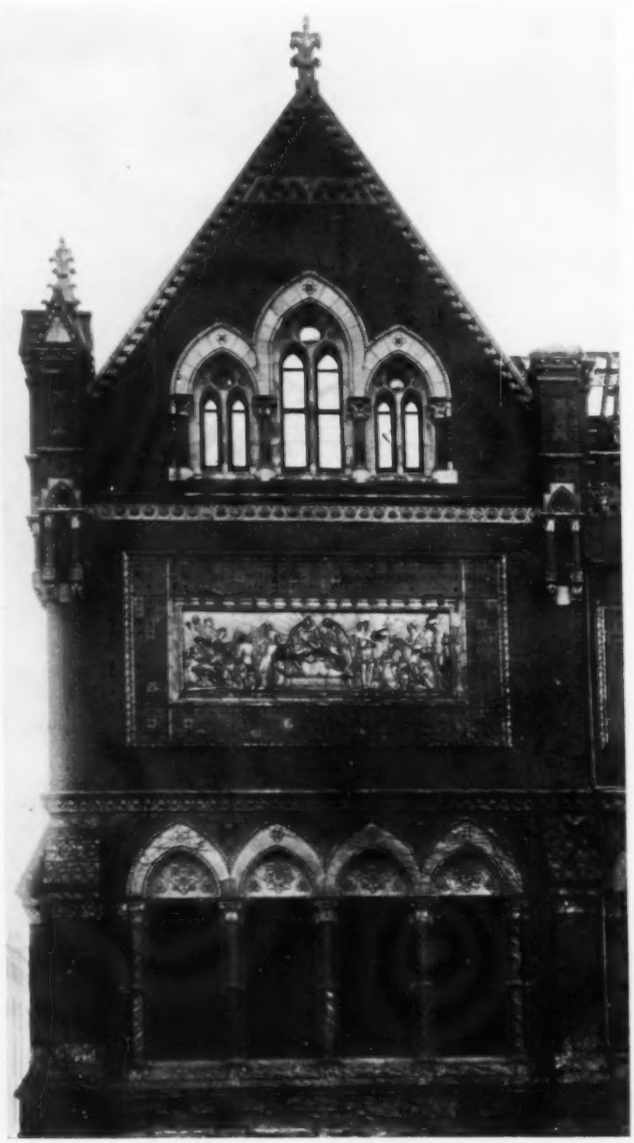
Carrère never forgot that he was a member of a great profession, and of his time and his thought he contributed much for its good and its advancement. The American Institute of Architects is deeply indebted to him for his active initiative and his sound advice in many emergencies; and he will be missed in many other bodies where he was a strength and a dependence. But above all he will be missed by his many friends, in and out of the profession, who looked to him for aid and for sympathy whenever the need arose. It is a great sadness to think that he can never drop in on us again, with that buoyant manner, that enthusiasm and that sincere and friendly smile that we knew so well.

WALTER COOK.

# An Early Example of the Use of Terra Cotta in America.

THE old Art Museum, Copley Square, Boston, which has been torn down to be replaced by a large modern hotel was in many respects an interesting building — and marked a new departure in the use of materials in America.

Mr. John H. Sturgis, of the firm of Sturgis & Brigham, the architects for the building had received much of his architectural education in English offices, amongst others that of J. K. Colling, who had published the work known as Collings Art Foliage. That work was an attempt, more or less successful, to adopt naturalistic leafage — flowers, etc., and modern detail in the manner of English Gothic, such as is to be found in Lincoln Cathedral. It was rather the aftermath of the early Victorian Gothic revival, and the designs had the rather geometric characteristics of certain types of English stone carving, which was broad but effective. These designs as used by Mr. Colling were employed not only for the interstices of structure, such as spandrels, tympana, roundels and foils, but also somewhat indiscriminately for the surfaces of walls and of columns. The result was an effect of richness and texture obtained with economy of labor.



ART MUSEUM, COPLEY SQUARE, BOSTON.
(Recently demolished.)

But even this amount of labor was prohibitory with the funds at hand for the museum and the experiment was made (a brave experiment in our climate) to obtain the effect in a less expensive material than carved stone, i.e., terra cotta. The result was that the details while made for terra cotta partook of the character of stone carving, and had less of the plastic quality of modeling than appears in the terra cotta of Northern Italy. The details for the terra cotta, while designed in the office of Sturgis & Brigham, were redrawn to a scale of 13 inches to the foot to allow for the shrinkage in the material, which was made in Stoke-on-Trent, England, as the terra cotta industry was at that time in its infancy in this country. Before the final work, that of the porch, could be completed, the English Company met with reverses, and the terra cotta of the porch was made in New Jersey, and was amongst the first of American ornamental terra cotta.

While the best English made terra cotta has never been allowed to be as good as that now being made in the United States it is nevertheless true that the decorative panels — one of which is shown in the illustration — have successfully withstood the test of time and a rigorous New England climate and are to be given a permanent abiding place in the Boston Art Museum.

The façade while picturesque from the characteristics of the style in which gables, pinnacles and finials were employed, was simple and symmetrical in its masses and well proportioned, and, facing the north so that it obtained little direct sunlight, was all the more effective because of its contrasts of color — both yellow and red terra cotta being used. The large panels upon the front were by Bartholdi, the sculptor of the Lion of Belfort, and of the Liberty in New York harbor.

The museum always suffered from its proximity to the Public Library and Trinity Church — both of which were larger in scale. It was of the class of design which gains by a certain amount of isolation with terraces or parked grounds about it. It is to be regretted that the changes in civic growth should have necessitated its demolition.

# The Presentation of PRELIMINARY STUDIES of Architectural Subjects

III.

BY HUBERT G. RIPLEY.

"A sense of humor as intelligently applied to the eccentricities of architecture is one of the last products of high civilization."—"*L. P.*," *Boston Transcript.*

THE most satisfactory preliminary drawings are those that are made after the building is all done. In a sketch of this kind it is possible to take advantage of natural bits of scenery, composition and lighting, at the same time suppressing unflattering details, adding foliage, planting, and accessories, and presenting the whole subject in its most favorable aspect.

It is frequently claimed that the ideal surroundings in the preliminary sketch give an exaggerated and false impression of the finished work, but in making the preliminary sketch after the building is all done, there is an opportunity to suggest not only ideal settings, but actual possibilities which might often be realized at trifling expense and labor.

Suppose your client has insisted on retaining some objectionable feature that mars the harmony of the composition, or that an otherwise perfect interior is spoiled by an ugly and glaring piece of amorphous furniture, or spot of color way off the key; here is a chance to show by illustration and comparison how the improvements and changes would look; and should the client remain insensible to their charm, you have at least an ideal presentation of your work that is invaluable for future use.

What preliminary sketch, for instance, could equal Bougerel's charming drawing of the temple of Andronicus Cyrrhestes, and, had his series of wonderful drawings of classical subjects appeared in a more appreciative age, would not the council of the Amphictyons have honored him as they honored Polygnotus, or Alexander honored Lysippus for his Apoxyomenos?

A better handling of his subject, or a more refined and restrained mastery of his medium than Bougerel displays, cannot be imagined; and yet all these drawings were made long after the buildings they illustrate were completed.

The architectural exhibitions, which form the chief winter indoor sport of the architects and draftsmen in our larger cities, usually contain several examples of the preliminary sketch made after the building is done; and in recent years, this form of amusement seems to be increasing. Some of the best things shown in these exhibitions are produced by glazing over enlargements of photographs taken from a carefully chosen point of view. These sun-prints may be made on good paper suitable for water color, and with a judicious use of body color for the foreground, taking advantage of accidental effects where intricate detail shows through a light glaze, an appearance of almost abnormal ability in draftsmanship is obtained. The aim should be to produce a drawing that bears little or no resemblance to a colored photograph, and this result is not hard to obtain if a little skill and "chic chic" is bestowed on some part that has no special relation to the building, such as the introduction of overhanging foliage, clipped ilexes, or Phylakian amphoræ. A well composed group of figures and a large touring car racing madly up the street complete the illusion.

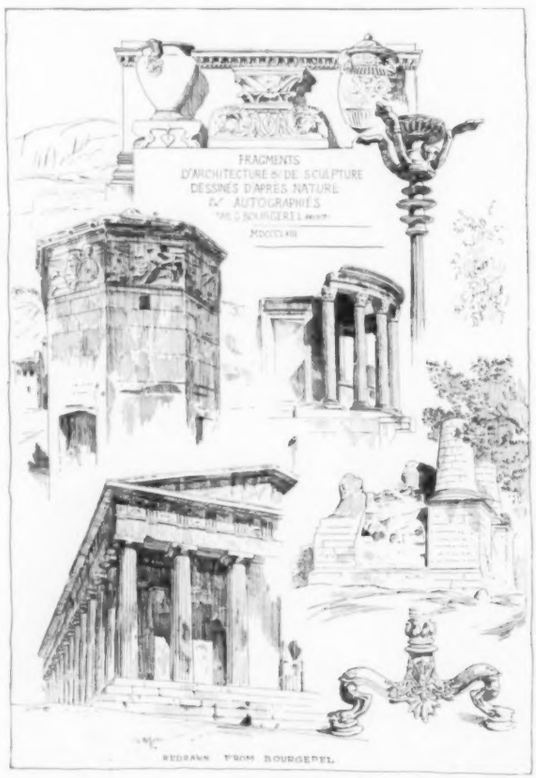



FIG. X.

A group of Bougerel's sketches redrawn to show how appropriate for architectural illustration is this little-used style of rendering. A close study of Mr. B's book will amply repay old and young in its revelation of the value and purity of line, extending through an exhaustive series of drawings without one cacophonous note.

It might be well to pause for a moment and summarize some of the better known methods for the presentation of sketches. This summary does not comprise all the inloidean secrets of the guild as the limits of these articles forbid an exhaustive treatment of the subject. The following list, however, will be found sufficient for ordinary purposes:

I. Pencil drawings on tracing paper from which prints may be made and rendered.

II. Pencil tracings rendered and mounted on cardboard and slightly tinted.

III. Pen and ink drawings, sometimes made on bristol-board or Whatman's paper, and sometimes made on tracing paper over rough sketches and printed in a black or brown line.

IV. Water color drawings, fifty-seven varieties, from those made with a few strokes of the brush to the elaborately studied "rendu."

V. "Calques" transferred to heavier paper or cardboard and rendered in a thousand and one different ways.

VI. Monotones including semi-monotones and demi-monotones.

VII. Rendered solar prints and salt prints and all sketches which use photography as a base.

As there have never been but the seven original Greek jokes and all subsequent jokes are merely variations of some well known theme, so there are only seven different ways of rendering drawings. There are, however, innumerable combinations resulting from the amalgamation, either in whole or part, of one or more of the above methods; but it is well to always bear in mind that the artless way is apt to be the best, and that the most forcible result is obtained by the drawing that, at least, looks unlabored, clean, and fresh; though a great deal of thought and time may have gone into its making.

A sketch may be studied and re-studied, fussed over and cussed at, rubbed out and re-drawn until its author has mental cirrhosis; then when reason begins to totter on her throne, spread the healing poultice of a fresh sheet of white tracing paper over this chyme, and new life will be injected into the exhausted brain muscles by its revelation of unsuspected possibilities, and the easy, natural result that nature intended will arrive.

The more elaboration there is in a sketch or drawing, the more rendering detail and finesse that is attempted, the more knowledge and skill its author must possess; for it is never safe to try to cover up defects by intricate and bedizened embellishments. The defects only appear the more glaring. Let the budding young Hornbostel tread the straight and narrow path for a while, following the footsteps of the early masters before he tries to scale the heights of Parnassus.

After even a small experience in drawing, say a year or two of study, the neophite is familiar with the well

known "forms of use, structure, and expression," as one might say, and he should be able to draw these forms from various points of view. The most natural and graphic portrayal is in perspective, and every draftsman should practice at odd moments, at home, on the train, in the office when the boss is not looking, at any and all times; little thumb-nail sketches in perspective of Doric, Ionic and Corinthian caps, cornices with brackets, doorways, windows, niches, balustrades, swags, cornucopiæ, anything that comes into his hand in any and all mediums; not forgetting the august cartouche. Copies should be made of bits here and there culled from the best sketches published in the magazines, studying the technique of the various virtuosos; now attempting Mr. Gregg's trees in pencil and trying to draw his foregrounds; (you won't be able to do it for nobody can do it just like that but Mr. Gregg himself) now copying, as well as you can, some exquisite detail in pen and ink of Mr. Goodhue's. Try also a sketch in color following as closely as possible Guerin or Birch Long, whose sketches are familiar through numerous reproductions, and whose masterly handling of architectural subjects with all their accessories has a sure and distinctive touch that proclaims them the last word, and withal, a simplicity and directness that breathes of asphodel and amaracus.

The first essays, the second and the third, and the twenty-third, will be failures. It is not so easy to lay a satisfactory wash as it is to pull the leg off a sawdust doll; but if one out of fifty sketches are really presentable, distinct progress is being made, and, eventually an individuality of style will develop that will at least be worth all the pains and labor to say nothing of the fun you will have in the trying.

It is to be noted that those, who by their agility and skill are able to dazzle and bewilder with the brilliancy of their technique, are most often contented with presenting their drawings in a simple restrained fashion.

In addition to, or possibly subtraction from, its artistic quality, a drawing or sketch of an architectural subject must express primarily form; and, unless the delineator is thoroughly grounded on form, and knows what he is drawing, and how it looks from every point of view inside and out, plan elevation and section, structure, mass, texture and material, no amount of cleverly contrived extraenous matter can hide its defects from the practiced eye; though the sketch may, nevertheless, serve its purpose perfectly by virtue of its sophistry.

FIG. XI.

Sketch for a commercial warehouse building, Andrews, Jaques & Rantoul, architects. The first drawing, made on water-color paper, showing the building in full sunlight, was somewhat turgid, so this drawing was traced over it, mounted on cardboard, and then washed in, in deep, full washes, using plenty of color and a flowing brush. The method illustrates the flexibility of the "calque" and shows how a brilliant result may sometimes develop from a jejune paradigm.

This may or may not be so, circumstances are so variable, and time is so often the governing factor, that not one sketch in ten, or even a hundred, is the perfect expression, as it should be, of the idea of its author. Suppose in the case of an important commission the architect has his "partie" fairly well determined, the building committee are pacified, and all looks rosy for a quick settling of preliminaries, and the clearing of the decks for immediate action; some influential person on the committee desires a perspective, or the newspapers want one for publication. The time is short and the whole office is busily engaged on the working drawings; the boss wears a worried look and divides his time between his expensive stable of Paris graduates and the telephone, stopping now and then to interview the representative of the Chicago clothes' dryer, and the Diogenes report man; Madeline, the rosy cheeked stenographer, is pounding her pretty finger tips pink and getting carbon paper on her violet cuffs, when John, the office boy, with eagle eye on the clock, announces a guy with long hair, velvet coat, flowing tie and a bored expression.

FIG. XII.

Study for a church, Calvin Keissling, architect, rendered in pen and ink on "vellum" tracing paper. Several vandyke prints were struck off by the X-Ray Blue Print Company and this reproduction was selected as one of several essays in wash, using Bistre as a medium. In the original, this luscious and pellucid brown harmonizes charmingly with the color of the lines of the print.

Enter the perspective man, who forgets his bored look for a minute as Madeline's great round eyes look trustingly at him. He and the boss talk over the "scheme" for a few moments using such words as "partie," "rendu," "laver," "entourage," "nouage," "bosquet," "trottoirs," "niche," "tricher," etc., etc., and then they come down to brass tacks and a discussion of whether the drawing had better be in monotone, water color or line. The artist respectfully suggests that sunrise effects are very popular this spring and that "gouache"

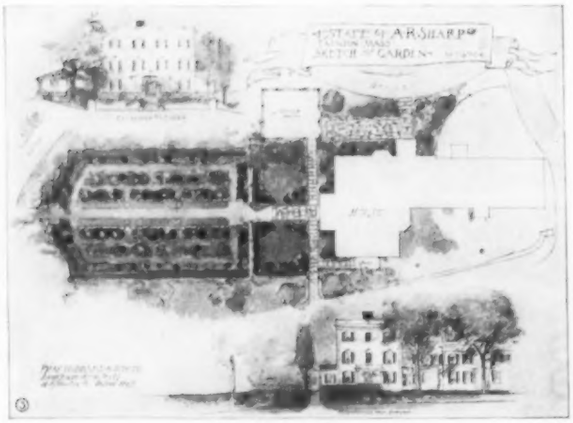


FIG. XIII.

One of "Pete" White's dashing renderings in color over a positive brown print of a pencil drawing. Mr. White holds the amateur middleweight championship for eastern Massachusetts in this line of work, and was one of the pioneers in developing the possibilities of the rendered print. They say that his blueprint bills sometimes average $40 a month.

FIG. XIV.

An example of rendering in wash and gouache over a solar print. Here and there the transparent limning allows the detail of the photograph to appear, and the drawing, by and large, may be described as a by-product of the aquarelle. The design shows a splendid impulse in the Alfalfa Renaissance.

is being used extensively, though for his part he thinks there is nothing like a delicate pen and ink or transparent water color, or even a crisp and "coulant" pencil sketch, if time is a factor. That brilliant and stirring Palladian motive in the top story with the "art nouveau" panel deserves to be "brought out" as forcibly as possible, and for the foreground he suggests a 1912 model fore door "landaulet," with a gentleman in frock coat leaning on a cane staring at a couple of coryphées, and a little boy selling a paper to a paralytic. The park and fountain with a "bosquet" of trees on one side and a thunderstorm coming up from the southwest, through which is seen a factory chimney way off on the horizon on the left, and a church spire on the right.

All this time the architect is wondering how much he is going to be stung for, and the perspective man is wondering how much of the architect's bank account he can annex without jeopardizing his future emoluments.

With a promise to have the drawing by Tuesday, and a sidelong look at Madeline, the artist departs, a roll of "calques" under his arm. On Tuesday the architect telephones and learns, that to do the subject justice, more time is required, and about Friday the finished drawing arrives. The artist stands anxiously and humbly on one foot, listening to the criticisms. Sometimes the boss gives the drawing a quick glance, says "humph," and retires into his private office; sometimes he looks for a long time without saying anything; often, very often, radical changes are suggested, and that little part right in there, that the artist was most proud of, must be washed or rubbed out, as it destroys the harmony of the composition, or disturbs the balance of the design. Then the trees should be simplified; they are too restless and need to be "pulled together"; the figures are badly composed, the automobile should be coming, not going; and the clouds are too heavy or too light; besides, the building is not the right color and the point of view is all wrong; it doesn't do the building justice or express the idea at all.

About four years afterward the perspective man visits the same office and sees that very drawing expensively framed and hung in a commanding position, and the architect greets him warmly and says, "That's the best drawing you ever made for us, old man, I bet you couldn't do as well as that now," and the artist says no he couldn't.

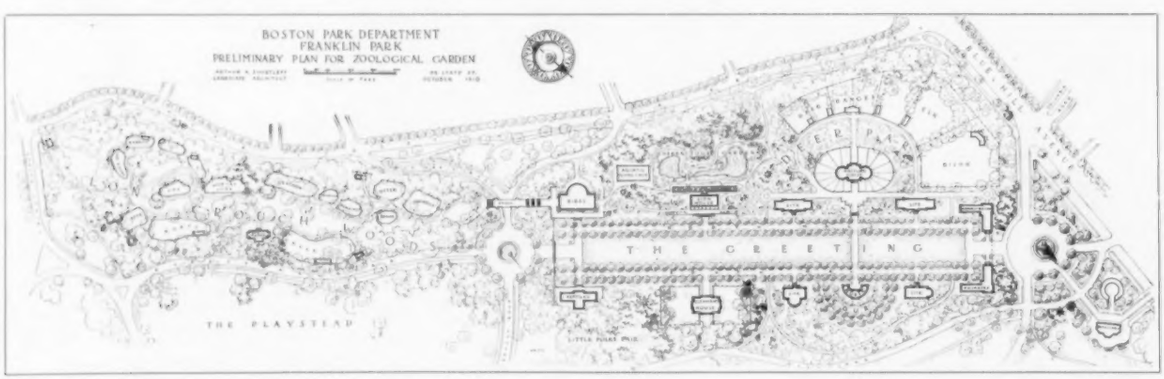



FIG. XV.

Showing that pen and ink as a medium is suitable for the presentation of plans as well as elevations, sections and perspectives. The conditions and surroundings are faithfully portrayed and the rendering could have been carried even further had it been essential.

# The Manual Training High School.—III.

BY WILLIAM B. ITTNER.

## EMERSON SCHOOL, GARY, INDIANA.

THE Emerson School is the first of a series of school buildings completed for the new Steel City. It is unique in the fact that it is designed to accommodate what is called a continuation, or all-day-long school, upon industrial lines. It is also a social center for the district in which it is located.

Although providing the equivalent of but two years of high school work it has a special problem to fulfil in the education of the mixed foreign element which makes up the majority of the population of the city.

The building has a dimension of 245 feet by 141 feet 9 inches, not including the boiler and fuel house which is located immediately to the rear of the building.

GROUND FLOOR. The ground floor contains six regular class rooms, two kindergarten rooms, and two library rooms each being the equivalent of a class room. There are also four manual training rooms with storerooms, etc., each room being the equivalent of two class rooms.

There are two gymnasia with lockers, wash and toilet room, each the size of two class rooms and opening upon a swimming pool with shower baths. All class rooms and workrooms on the ground floor are above the grade of the playground.

In addition there are two large locker rooms, one janitor storeroom, two general toilet and wash rooms, rooms for heating plant, boiler room, ash room, and a coal room which will hold one season's supply. The play-ground is 320 by 295 feet. On the ground floor is a corridor 16 by 180 feet which will be used for play during bad weather.

FIRST FLOOR. The first floor contains twelve regular class rooms, a principal's office, two teachers' rooms, a storeroom for the distribution of all school supplies, two large locker rooms, two general toilet and wash rooms, and the main floor of the auditorium. The auditorium seats five hundred and forty-six adults, and has a stage constructed in accordance with the fire ordinance of the city of Chicago.

MAIN ENTRANCE, EMERSON SCHOOL.

The large main corridor is planned and lighted for a School Art Gallery as well as for general hall purposes.

SECOND FLOOR. The second floor contains twelve regular class rooms, two manual training rooms the same size as class rooms, the gallery of the auditorium which seats two hundred and seventy-eight adults, two rooms for infirmaries, a conservatory for housing and propagating plants, and two general toilet and wash rooms. The large main corridor is used for a school museum.

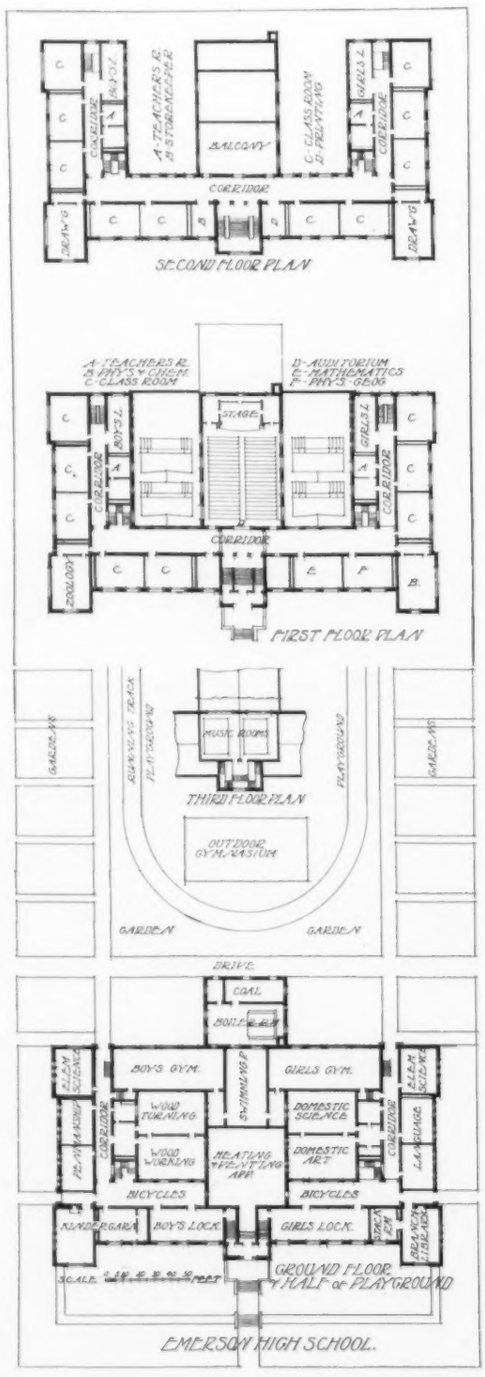
THIRD FLOOR. The third floor contains a drawing room equal in size to two class rooms.

SUMMARY. The number of regular class rooms or equivalents in the building is as follows: Ground floor, twenty-four; first floor, twelve; second floor, fourteen; third floor, two—making a total of fifty-two. In addition to these there is an auditorium that will seat eight hundred and twenty-four adults, four locker rooms, six general toilet and wash rooms, two rooms for infirmaries, two teachers' rooms, office, and two storerooms. There are also large well lighted halls for an art gallery, school museum and a conservatory, besides the usual required space for general purposes.

The construction is fireproof except the roof which is of mill construction. All walls are built of vitrified brick laid in cement mortar. The ground floor corridors, manual training rooms, all lockers, toilets, wash rooms, gymnasia, and the swimming pool room have white enamel brick wainscoting 7 feet high. All corridors have marble base. All stairs are of reinforced concrete with asphalt treads, marble risers, stringers, and newels. The closet and urinal stalls in toilet rooms have marble partitions, and are equipped with high-grade plumbing and electric fixtures throughout. The blackboards are natural slate. The interior finish is quarter sawed oak. All window stools are of glazed brick. A program master clock in the principal's office controls secondary clocks, the program bells in all class rooms and corridors and the play ground gongs. A telephone system is installed to necessary points throughout the building with switchboard in the principal's office.

Class rooms and corridors have floors of clear maple, while the ground floor corridor, toilet, locker rooms, etc., have floors of granitoid. The most approved heating and ventilating apparatus is used with automatic temperature and ventilation control. All air for heating and ventilating is washed before it is delivered to school rooms which lowers the temperature about ten degrees during hot weather and raises the humidity of the parched dry air in cold weather. This washer also removes all dust and soot which in a short time would otherwise ruin the school room walls and ceilings which are painted in oil.

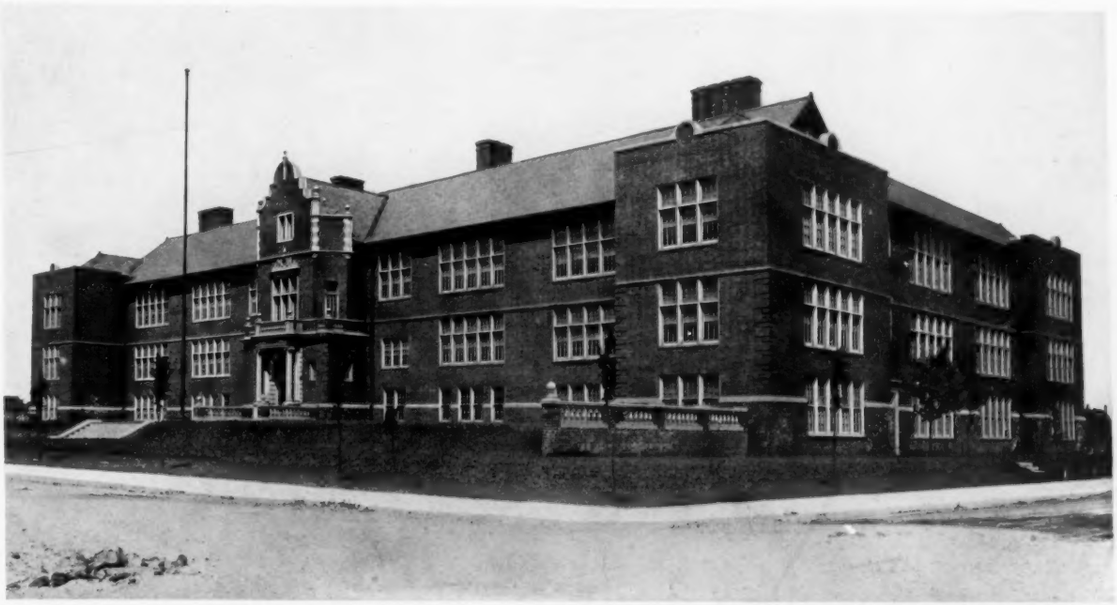
In describing the school in his last annual report Mr. Wirt Superintendent of Schools says, "With the customary school organization there are on the ground floor ten regular class rooms, on the first floor twelve, on the second floor twelve, and on the third floor one. This would make a total of thirty-five regular class rooms. With forty children per teacher they would accommodate fourteen hundred children, and on this basis the average architect would compute his per capita cost of the building to be about $140. However, two of these rooms are intended for a substation for the public library, one for a special music room, and another for a special drawing room, which would leave only thirty rooms for the regular class work. Of these thirty rooms four would be required for natural science laboratories where only half school room classes can be accommodated at one time. Thus we would have twenty-six rooms for regular classes of forty students each and four school rooms for classes of twenty students each, making a total of eleven hundred and twenty as the capacity of the building. The actual per capita cost with forty children per teacher would, therefore, be about $178.

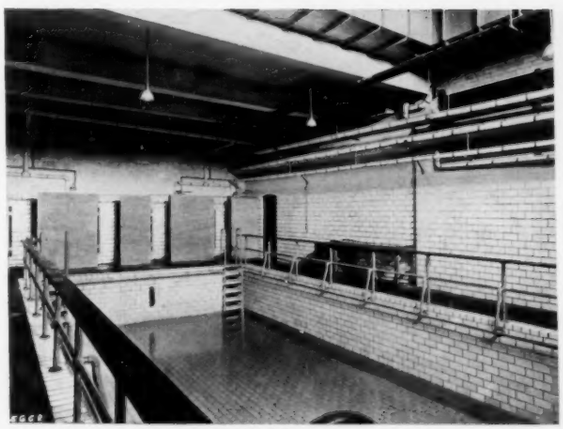



The customary school organization takes for granted that each child must have a regular school desk for his own exclusive use where he can keep his books and equipment. Therefore, when any class is on the playground, in the auditorium, physical culture rooms, laboratories, library, or special class rooms, the regular class room where the school desks of the classes are located is vacant. The separate school desk for each child's own exclusive use means practically that the school must provide two or more places for each child at the same time. Thus the school plant has a capacity for twice the number of children actually accommodated. Besides, the mortgage that the day school pupils have upon the desks prevents the use of the school rooms for night school. An entirely different plan will be used at our Emerson School. Each scholar will have a steel locker for his wraps, books, and equipment. After placing his wraps in his locker on arriving at the school he will take from the locker the books and equipment needed for his work until he is given the opportunity to return to the locker. With this plan no school desk belongs exclusively to any child but may be used by other children during the day school period, and the school plant can be used to accommodate practically double the customary number of children. The day school rooms will also be available for use by the night school. The steel lockers with the book compartments cost much less than the cloak rooms usually provided by the customary school organization and are much more satisfactory.

Figuring the capacity of our building at forty children per class room (or its equivalent) per teacher we are able to accommodate two thousand two hundred and forty children. We hardly expect to accommodate in actual numbers the full capacity figured but fully expect to accommodate easily, on the basis of forty children per teacher, eighteen hundred to two thousand students. This will make the per capita cost of the building about $100.

In addition to accommodating day students the school is so planned that we can accommodate easily fifteen hundred night school students without interfering with the work of the regular day school. With the customary





SWIMMING POOL.

CORRIDOR.

BIOLOGY LABORATORY.

COOKING ROOM.

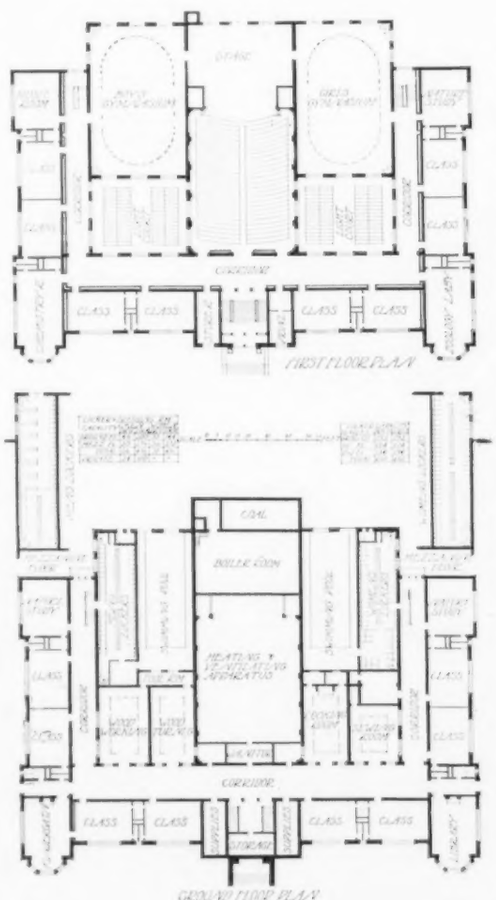
EXTERIOR AND FOUR INTERIOR VIEWS, EMERSON SCHOOL, GARY, IND.
William B. Ittner, Architect.

school organization this cannot be done, because it is difficult to use the regular school rooms occupied by day students with their individual desks for a different set of pupils in a night school.

Gary's school organization plans to train its children for the highest possible school efficiency in the most economical way. The special plan of organization for the Emerson School uses thirty rooms for the regular work which rooms accommodate ten hundred and forty students. While these children are in the regular work an equal number is accommodated in the remainder of the building in special work and play. We thus have two thousand and eighty children accommodated at all times during the day in addition to the kindergarten children. The only principle involved is that of occupying every part of the building all of the school day, and this is simple enough when the building is arranged especially for the purpose.

We are willing to admit that the advantages offered by schools of the type we have planned for Gary seem very extravagant and offer unheard of luxuries, so to speak. Even the largest cities do not have buildings which give the same opportunities to their children. But this type of building is extravagant only in the opportunities offered. From the standpoint of the taxpayer this type of building is extraordinarily economical."

GARY'S SECOND SCHOOL, GARY, IND.




PLANS OF GARY'S SECOND SCHOOL.

## GARY'S SECOND SCHOOL BUILDING.

THE second school of the series, plans for which are now in preparation, will provide the same number of class and special rooms, with the addition of a small laundry for instruction in this important part of domestic economy. It will also accommodate the same number of pupils as the Emerson School.

Like the Emerson School it will be located on a large site, 550 by 815 feet, giving the necessary space for a public park and playground which will be fully equipped. Toilet accommodations will be provided in the building for the public grounds.

The special features of the school differing from the Emerson School, will be the abandonment of the general toilet accommodations for the pupils except on the ground floor, and the introduction of toilet rooms opening directly from the class rooms. Where this is an unusual feature it is felt that it will give the supervision necessary in a school of this character and simplify the problem of school management.

Another feature worthy of special mention is the enlarging of the gymnasia, with independent entrances to the playground. There will be also two swimming pools, each 21 by 60 feet, with locker and dresser booth accommodation for four hundred men and three hundred women. All of these will be used by the people of the school district independent of and without interference with the work of the school. The stage will also be enlarged and arranged for use as a third gymnasium.

The teachers in charge of the gymnasia and play in the school will also supervise the public playground. This important part of the municipal work will then be carried on without additional cost to the city other than the first cost of laying out and equipment.

Plans of the new school are given and since the Emerson School is described at length this building will be passed without further comment except that it will cost about $200,000 ready for its equipment.

# The Heating and Ventilation of Churches.—II.

BY CHARLES L. HUBBARD.

IN DESIGNING a system of indirect steam, much of the data given for furnace heating will remain the same, and in treating of this it is proposed to take up the different items in order, noting what changes are necessary.

Indirect steam is applicable to much larger buildings, because the heat may be generated in a single boiler, or battery of boilers, and the warm air introduced at a larger number of points. This method of heating may be employed in buildings seating up to five or six hundred people, or even more, although the air supply to the different heating stacks will become somewhat complicated in this case. Where the first cost will allow it, a fan system will give more satisfactory results in churches seating three hundred or more.

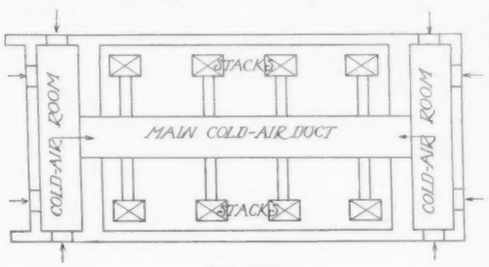



FIG. XII.

Taking this up on the unit basis, as before, the air supply may be taken practically the same as in furnace heating. The grate surface should be increased to 6 square feet in this case to allow for the aspirating coils or flue heaters. The fact that the heat is transmitted in the form of steam instead of hot air, makes no difference in the amount of fuel burned or the size of grate and chimney, provided the same results as regards heating and ventilation are to be obtained.

The heating stacks in this class of work are commonly made up of indirect pin radiators, placed at the base of the flues. They are usually encased in galvanized iron, although heating chambers of brick may sometimes be used to advantage in the case of large stacks. The total amount of heating surface may be based on the number of occupants, allowing 350 square feet of radiating surface to each one hundred people. One disagreeable feature in connection with furnace heating is the presence of cold drafts beneath large windows. This may be greatly lessened, if not done away with entirely, by placing heating stacks beneath, in the basement and connecting them with narrow grilles extending the full length of the window sill. The rising current of warm air will thus tend to intercept the downward flow of cold air from the surface of the glass, and thus prevent the draft.

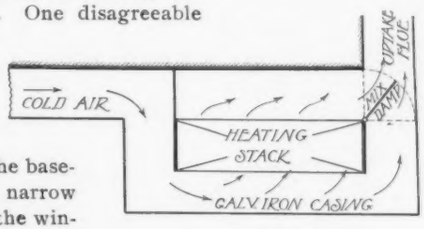



FIG. XIII.

As the number of heating stacks is increased, the difficulty of arranging the cold-air supply becomes greater.

For this reason it seems well to place the larger part of the surface in four stacks at the corners of the room, following out the general arrangement shown in Fig. I, and supplementing this with a series of smaller stacks along each side under the windows, as already described. The main stacks may receive their supply from cold-air rooms, the same as in furnace heating, or from trunk lines as in Fig. XII. When it is not convenient to carry a main duct through the basement as shown, satisfactory results may often be obtained by placing the four large stacks in the cold-air rooms and omitting the bottoms from the casings, thus allowing the air to flow directly through them without the use of supply ducts. The small intermediate stacks may take their supply from special ducts leading from the cold-air rooms, or through special wall openings adjacent to them. The object of the connecting duct, or trunk line, is to make use of changes in the direction of the wind by taking air from all points of the compass, and thus getting the benefit of wind pressure under all conditions. When the cold-air duct is carried through rooms which are to be warmed, it is well to enclose it with a furring of lath and plaster, both on account of looks and to prevent the cooling effect of its exposed surface.

The stacks should be divided into separately valved sections for rough regulation, according to the season, and also be provided with mixing dampers for closer adjustment. These dampers are the same in principle as those used in furnace heating, simply being changed in form to adapt them to the changed conditions, as shown in Fig. XIII. The supplementary stacks beneath the windows are not usually furnished with mixing dampers, but may be divided into two valved sections each.

Provision for air rotation may be made the same as for furnace heating when cold-air rooms are used; otherwise, doors may be provided in the sides of the trunk airways, or in the bottoms of the stack casings, for taking air from the basement.

The size and construction of the supply and vent flues should be practically the same as already described, which, based on the size of the heating stack, will call for 2¼ square feet sectional area for each 100 square feet of radiating surface. The stack heater in this case is replaced by an aspirating coil, containing about 60 square feet of radiating surface. With this arrangement it is not necessary to carry the vent flue to the basement, as in furnace heating, because the coil or heater may be placed directly above the vent opening, as shown in Fig. XIV. This has the advantage of simplifying the duct construction, reducing the resistance because the air can flow directly upward, and also of allowing the vent registers to be placed in the wall instead of in the floor, which is a decided advantage on account of cleanliness. The aspirating coil should be in the form of a shallow heater, one or two rows of pipes deep, having a free area between the pipes equal to the full sectional area of the flue in which it is placed. This

result can be secured by making the length of the pipes twice the depth of the flue and placing it in an inclined position as indicated in Fig. XIV. The method sometimes employed of bunching the heating surface in compact form and hanging it in the center of the flue is to be avoided. This arrangement is liable to set up a local circulation within the flue as indicated by the arrows in Fig. XV and tends to weaken the draft through the vent register connecting with the room. In buildings of considerable size more positive results can be obtained, especially in mild and heavy weather, by the use of a discharge fan in place of the aspirating coils in the vent flues. This arrangement will reduce the number and size of the outboard vent flues, which is often an item of much importance. A vent fan in connection with an indirect gravity supply system gives very satisfactory results, and can often be installed at very little, if any, additional cost over a system of natural ventilation with aspirating coils. This is because of the reduction in number and size of flues, omission of coils and piping, and the smaller size of boiler. Disk fans are generally employed for this purpose driven at a moderate speed by direct-connected motors, when a direct current is available. In buildings of medium size it is generally possible to connect all of the vent registers by means of galvanized iron ducts beneath the floor with an exhaust chamber in the basement, from which the fan will discharge the entire volume of air through a single outboard flue which may be located where most convenient. A flue velocity of about 650 feet per minute may be allowed where the fan is made to discharge into the side of the flue and provided with a curved deflector, while 800 feet or more is easily obtained without undue noise when the fan is placed in the base of the flue itself, with the shaft in a vertical position.

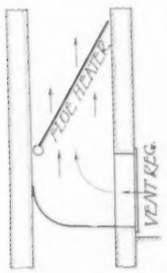



FIG. XIV.

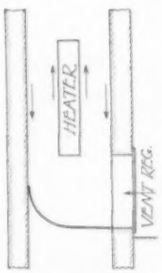



FIG. XV.

TABLE II.

| Number of occupants. | Air volume, in cubic feet per min. | Diameter of fan, in feet. | Speed of fan, rev. per min. |
|---|---|---|---|
| 300 | 6,000 | 3 | 400 |
| 400 | 8,000 | 3 | 530 |
| 500 | 10,000 | 4 | 300 |
| 600 | 12,000 | 4 | 350 |
| 700 | 14,000 | 5 | 200 |
| 800 | 16,000 | 5 | 230 |
| 900 | 18,000 | 6 | 150 |
| 1,000 | 20,000 | 6 | 170 |

These velocities call for approximately 3½ and 2½ square feet of flue area, respectively, for each one hundred occupants. When the building is of considerable length it may be difficult to connect all of the vent registers with a single exhaust chamber. In cases of this kind two fans may be used, one at each end of the church. Table II gives size and approximate speed of the average disk fan required for moving different volumes of air per minute under the conditions above described.

Arranging the data on the "unit" basis for one hundred people, as in the case of furnace heating, we have the following:

TABLE III.

Data and dimensions for indirect steam heating apparatus, for each one hundred occupants. Outside temperature 0.

| | | |
|---|---|---|
| Grate surface of boiler, including that required for aspirating coil | 6 | square feet |
| Indirect heating surface | 350 | " " |
| Aspirating coil | 60 | " " |
| Supply or warm-air flue | 8 | " " |
| Vent flue | 8 | " " |
| Cold-air supply duct | 7 to 8 | " " |

The above is for a straight gravity indirect system. When an exhaust fan is used, reduce the size of vent flue as already noted in connection with fans. Here, as in the case of furnace heating, no account has been taken of other rooms besides the auditorium. These may be cared for either by direct or indirect radiation, according to whether ventilation is required or not. The additional boiler power may be figured from the relations already given, counting each 100 square feet of direct surface as 50 of indirect.

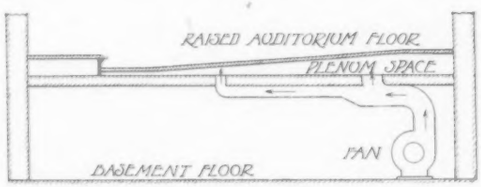



FIG. XVI.

When a supply fan is used, and the fresh air forced in under pressure, it is possible to admit it through a large number of small openings. This changes the general arrangement of the supply and vent openings for several reasons. As the power for moving the air is small, a larger volume of air can be introduced at a lower temperature, which gives practically the same heating effect with better ventilation. Again, as the air can be introduced through a large number of small openings evenly spaced over the entire auditorium floor, it has the effect of causing a solid body of air to rise slowly and uniformly from floor to ceiling, which is the reverse of the action in gravity heating, where the fresh air first rises to the ceiling and then falls to the breathing line, as already described. With a fan system, the fresh air rises directly to the

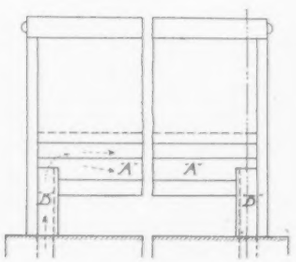



FIG. XVII.

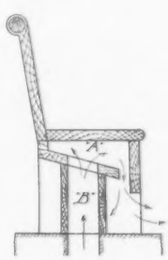



FIG. XVIII.

breathing line, but so slowly that no drafts are felt, and then passes on to the upper part of the room where it is taken off through ceiling vents instead of being removed at the floor level.

One of the best methods of air distribution is shown in diagram in Fig. XVI. A plenum space is provided by constructing a false floor, and the air discharged into this by the fan, as indicated. This provides a reservoir of fresh warm air under the entire auditorium floor which may be introduced into the room through the pews as shown later in Figs. XVII to XX. When the plenum space is shallow it is well to introduce the air at several points, in order to secure an even distribution of pressure without high velocities. When there is a height of 2 or 3 feet at the rear, it is generally sufficient to introduce the air at one or two points, providing suitable baffle plates for distributing it evenly. When the raised floor cannot be used, the same result may be secured by carrying a series of ducts at the basement ceiling and connecting with the pews above. One of the most satisfactory methods of admitting and distributing the air is shown in Figs. XVII and XVIII. A shallow chamber is constructed beneath the seat of each pew, and shown at "A" "A" in the cuts. This connects with the plenum space at each end by means of small uptakes "B" "B" built into the pew, as shown. From the chamber "A" the air passes into the room through a slot about 1¼ to 1½ inches in width, extending the entire length of the pew. The area of the slot is so large that the air issues at a velocity so low that no unpleasant drafts are felt by the occupants. When the plenum space beneath the floor is employed, it is not usually necessary to use a tube for connecting it with the pew. Openings are simply made in the upper floor, of the proper size and form, and the pew ends or legs set over them. When ducts are used at the basement ceiling, it is necessary to use sleeves, or thimbles, extending up through the floor and into the pew openings to avoid leakage. The uptakes "B" "B" should have an area of at least 4 square inches per occupant.

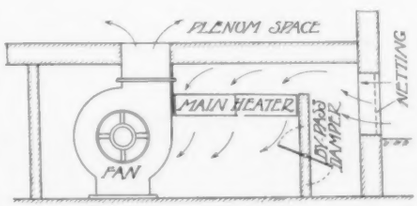



FIG. XXI.

Another arrangement which may be used, where that above described is considered too expensive, is shown in Figs. XIX and XX. In this case a grille is placed in the end of every other pew, alternating on each side of the aisle, and is connected with a duct carried along the basement ceiling, by means of a galvanized iron uptake-sleeve shown at "C" "C."

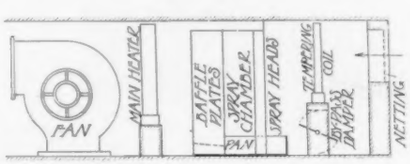



FIG. XXII.

If allowance is made for an average of five people in each pew, and a grille is provided in every other pew, it must supply 2 by 10 by 25 = 500 cubic feet of air per minute. Allowing a velocity of 350 feet per minute over the entire face of the register will call for 1½ square feet of area. A better arrangement is to use two registers to each uptake, one discharging into the aisle as shown and the other throwing part of the air into the pew. In order to make this arrangement as perfect as possible, an uptake and two grilles, or registers, should be provided for each pew, which makes it as expensive as the arrangement shown in Figs. XVII and XVIII.

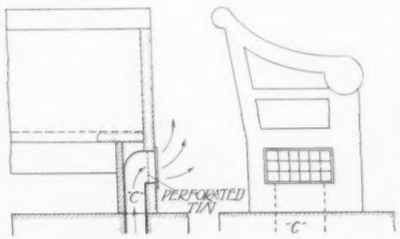



FIG. XIX. FIG. XX.

The uptake "C" should have a sectional area of at least ½ square foot for 500 cubic feet of air, and one-half that when an uptake is carried to each pew. An even flow over the entire register face may be secured by inserting a piece of perforated tin having a free opening equal to about one-third of its gross area. The position of this is indicated in the cut. The air supply to the pew uptakes is usually made by means of trunk lines connecting with the fan, and carried at the basement ceiling below the center of each aisle.

Fans for church ventilation should be run at comparatively low speeds on account of noise, and are best driven by direct-connected electric motors, if a direct current is available. If an alternating current must be resorted to, a high-speed belted motor must be used, placing a sound deadener between the base of the motor and the foundation, and covering it with a wooden box having an asbestos lining.

When the air is blown through a heater at a high velocity by means of a fan, a greater amount of heat is obtained per square foot of radiation, due to the more rapid condensation of the steam within it. For this reason, less radiating surface will be required with a fan system than in the case of indirect gravity heating.

The size and maximum speed of fan for handling different volumes of air, under the conditions of church work, are given in Table IV.

TABLE IV.

| Diameter of fan, in feet. | Maximum speed at which fan should run, rev. per min. | Cubic feet of air delivered per minute. |
|---|---|---|
| 3 | 300 | 4,200 |
| 4 | 250 | 8,200 |
| 5 | 225 | 14,000 |
| 6 | 200 | 20,800 |
| 7 | 175 | 27,600 |
| 8 | 150 | 36,400 |
| 9 | 125 | 43,200 |
| 10 | 100 | 48,000 |

Under average conditions, allowing an air supply of 25 cubic feet per minute per occupant, the main heater at the fan should contain about 230 square feet of radiating

surface for each one hundred occupants. A fan system supplying air to the room through the pews, as described, can only be used for warming when the fan is running; hence a supplementary system must be provided for heating the auditorium when the fan is not in operation. There are different methods for doing this, depending upon local conditions. One arrangement is to use direct radiators, concealed by screens, while in other cases, indirect stacks are hung beneath the floor, with registers above them, and taking air from inside the building by rotation. In either case, the supplementary system should be placed on a separate line of piping, so that it can be turned on or off by a single pair of valves.

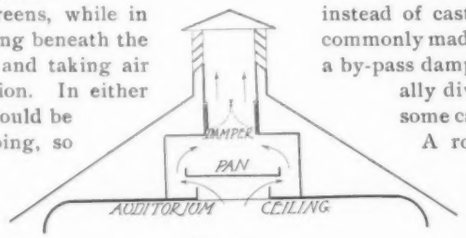



FIG. XXIII.

The amount of heating surface in the supplementary system must be computed in each special case, according to the amount of wall and window surface, and has no fixed relation to the fan system. The type of boiler used in this size of building is usually rated on a horsepower basis, and may be proportioned according to the data given below.

TABLE V.

One boiler horsepower will supply:
25 square feet of radiation at the fan.
100 square feet of radiation in the form of rotation heaters beneath the floor.
130 square feet of direct radiation placed in the room.

Here, as before, only the auditorium has been considered, and other rooms must be taken up independently, and sufficient boiler power furnished to care for them.

A typical arrangement of fan and heater is shown in diagram in Fig. XXI. The heater in this case is made up of pin radiator sections, and supported at an elevation above the floor. The path of the air is indicated by the arrows and its temperature is regulated partly by shutting off certain sections by means of valves, and partly by use of the by-pass damper, which allows cold air to enter the fan without passing through the heater. The fan in this case is arranged to discharge directly into a plenum chamber beneath the main floor of the auditorium. Fig. XXII shows the general arrangement for an air washer, or purifier, in connection with a fan and heater. The air is first drawn through a primary heater, or tempering coil, to raise its temperature above the freezing point. It then passes through a spray of water which removes the dust and soot; then through a series of baffle plates for removing the spray, and finally through a secondary or main heater for raising it to the required temperature before entering the fan. The heaters shown in this case are made up of vertical wrought-iron pipes instead of cast-iron sections. The outer one is commonly made two rows deep, and provided with a by-pass damper. The secondary heater is usually divided into valved sections, and in some cases is provided with a by-pass also.

A roof section showing a typical arrangement for a ceiling vent is illustrated in Fig. XXIII. When a supply fan is used, it is not usually necessary to provide either an exhaust fan or aspirating coils, as the pressure created within the room is sufficient to force the air out without other means. The ceiling and roof vent should have from 3 to 4 square feet sectional area for each one hundred occupants, and should be so designed that rain and snow cannot find its way into the auditorium in case of temporary back drafts. Such an arrangement is shown in Fig. XXIII.

Fig. XXIV shows an interior view of the First Church of Christ, Scientist, Boston, and illustrates a practical application of the principles previously described. An air supply of approximately 90,000 cubic feet per minute is forced into the auditorium by means of four centrifugal fans located in the basement. The air first passes through washers, is then reheated, and discharged into a plenum space beneath the raised floor, in a manner similar to that shown in Fig. XVI. From here it reaches the auditorium through pews designed on the general principle illustrated in Figs. XVII and XVIII. The fresh-air supply to the balconies is the same as on the main floor, special plenum spaces being provided for this purpose.

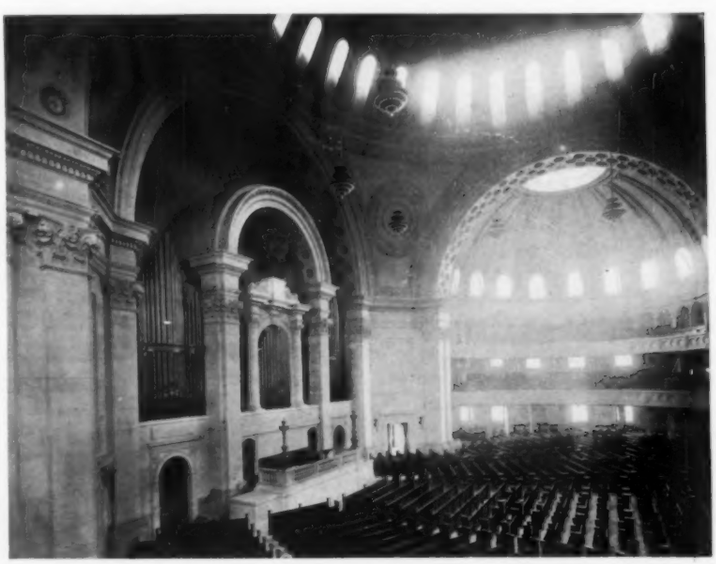


FIG. XXIV.

The supplementary heating system for warming the church, when the fans are not in operation, consists of direct radiators placed back of bronze grilles beneath the first floor windows, and of rotation heaters beneath the gallery floors. The exhaust ventilation is through a large concealed vent in the domed ceiling, which in turn connects with outboard vents designed especially to prevent the inleakage of rain and snow.

# The Comparative Costs of a House of Moderate Size When Constructed of Brick, Wood, Cement, or Hollow Block.

AT THE annual meeting of the Building Brick Association, held at Louisville, Ky., February 7th, 8th and 9th, the secretary, Mr. J. Parker B. Fiske, submitted a report of an extensive investigation which he had conducted to determine the relative cost of a small house built of brick, frame and other types of construction. The very thorough manner in which Mr. Fiske has gone into this subject gives to his figures a value which is not usually credited to data of this nature.

Mr. Fiske procured plans and specifications of a given house, to ascertain by actual bids from a number of reliable contractors its difference in cost when constructed of frame, brick, cement, or hollow block. For this purpose a small, modern eight-room house of good design and excellent arrangement was chosen, the original having been actually built at Beverly Farms, Mass., under the direction of Thorndyke & Kiessling, architects. This house is typical in size, arrangement and cost to thousands of houses which are being erected throughout the country.

The architects were commissioned to prepare the plans and specifications necessary for obtaining bids for this house when built with the following types of exterior wall construction, all other details being common to all types.

## DESCRIPTION OF VARIOUS TYPES OF OUTER WALL CONSTRUCTION.

Type 1. Frame covered with boards and finished with clapboards over building paper; inside surface furred, lathed and plastered.

Type 2. Frame covered with boards and finished with shingles over building paper; inside surface furred, lathed and plastered.

Type 3. A 10-inch brick wall, i.e., two 4-inch walls tied together with metal ties and separated by a 2-inch air space; inside surface plastered directly on the brickwork. Face brick to cost $17.50 per M.; inside brick, $9.00 per M.

Type 4. A 12-inch solid brick wall; inside surface furred, lathed and plastered. Face brick to cost $17.50 per M.; inside brick, $9.00 per M.

Type 5. Eight-inch hollow terra cotta blocks, stuccoed on the outside and plastered directly on the inside.

Type 6. Six-inch hollow terra cotta blocks, finished with a 4-inch brick veneer on the outside and plastered directly on the inside. Face brick to cost $17.50 per M.

Type 7. Frame covered with boards and building paper, furred and covered with stucco on Clinton wire cloth; inside surface furred, lathed and plastered.

Type 8. Frame covered with boards (building paper omitted), and finished with a 4-inch brick veneer on the outside; inside surface furred, lathed and plastered. Face brick to cost $17.50 per M.

Type 9. Frame finished on the outside with a 4-inch brick veneer tied directly to the studding (boarding omitted); inside surface furred, lathed and plastered. Face brick to cost $17.50 per M.

A separate drawing showing the details of each type of outer wall construction was prepared, and each was accompanied by a set of complete specifications for the entire house.

Everything about the house, except the outer wall construction, was identical in all nine types, and may be briefly covered by the following tables:

DETAILS COMMON TO ALL TYPES.

| | |
|---|---|
| A—Foundations | Local Stone. |
| B—Cellar Floor | Finished with 2-inch concrete of Portland cement. |
| C—Chimney | Faced with Brick costing $17.50 per M. |
| D—Fireplaces | Faced with Brick costing $17.50 per M. |
| E—Plastering | First-class "two coat" work. |
| F—Exterior Finish | Cypress. |
| G—Blinds | White pine. |
| H—Screens | Copper bronze on white pine frames. |
| I—Window Frames | Hard pine. |
| J—Floors | Double floors throughout, with paper between, except in unfinished attic; Georgia Pine upper floors; main hall on first floor of oak. |
| K—Inside Finish | North Carolina Pine. |
| L—Doors | Washington Cedar. |
| M—Hardware | Bronze finish of ordinary type, costing $60.00 for the job. |
| N—Wood Mantels | $45.00 each. |
| O—Conductors | Copper. |
| P—Flashing | Tin. |
| Q—Electric Fixtures | Costing $80.00. |
| R—Hot Water Heating | Costing $250.00 complete. |
| S—Wiring | Costing $68.00. |
| T—Plumbing | Costing $370.00. |
| U—Painting | Exterior and interior; clapboard house, $225.00; other houses, $130.00. |
| V—Glazing | Double thick German glass. |

NOTE.—Shades, kitchen range and tile work not included.

The following contractors of well-known reputation and experience were then selected: W. F. Kearns Company, Boston, Mass.; McDonald & Joslin Company, Boston, Mass.; P. H. Jackson and Son Co., Brockton, Mass.; R. D. Donaldson, Lincoln, Mass.; J. T. Wilson & Son, Nahant, Mass.

Each contractor was fully advised of the object of this investigation, and was asked if he were willing to undertake the preparation of figures which should truthfully set forth, to the best of his ability, the cost (including his profit), of a house to be built within ten miles of Boston, according to these plans and specifications. Mr. Fiske impressed them all with the fact that he desired to know the exact truth; and if, as alleged by some contractors, the cost of a brick house is twenty-five to thirty per cent more than one of wood, that he wished to know it, as nothing could be gained by an investigation of this kind which was biased or influenced by any favoritism for one type over another. The contractors entered into the spirit of the investigation heartily, and agreed to figure out the cost fairly, to the best of their ability. Each one was given the same information and instructions, and asked to take plenty of time to figure the entire house with care.

The following bids were submitted by the five contractors in question, arranged without reference to the above order of names, each bidder standing ready to enter into a contract for the house in question at the figures submitted:

COMPARATIVE BIDS.

| Type No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Description | Clapboard | Shingle | 10-inch Brick Wall Hollow | 12-inch Brick Wall Solid | Stucco on Hollow Block | Brick Veneer on Hollow Block | Stucco on Frame | Brick Veneer on Boarding | Brick Veneer on Studding |
| Bid No. 1 | $6,732.00 | | $7,572.00 | | $7,416.00 | $7,777.00 | $6,857.00 | $7,130.00 | $7,080.00 |
| Bid No. 2 | 6,235.76 | $6,370.40 | 6,736.43 | $7,105.00 | 6,491.23 | 6,762.83 | 6,410.00 | 6,746.20 | 6,664.88 |
| Bid No. 3 | 6,692.00 | 6,786.00 | 7,118.00 | 7,418.00 | 7,179.00 | 7,238.00 | 6,847.50 | 6,970.00 | 6,895.00 |
| Bid No. 4 | 6,600.00 | | 7,496.00 | 7,801.00 | 7,202.00 | 7,648.00 | 7,000.00 | 7,496.00 | 7,420.00 |
| Bid No. 5 | 7,450.00 | 7,450.00 | 7,940.00 | 8,240.00 | 7,650.00 | 7,990.00 | 7,650.00 | 7,790.00 | 7,710.00 |
| Average of Bids | 6,759.95 | 6,868.80 | 7,372.48 | 7,641.00 | 7,187.65 | 7,483.16 | 6,952.90 | 7,226.44 | 7,153.98 |

A comparison of these five bids, with reference to the excess cost of the various types as compared with the clapboard house, was also shown:

COMPARATIVE BIDS.

PERCENTAGE EXCESS COST OF EACH TYPE OVER CLAPBOARDS.

| Type No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Description | Clapboard | Shingle | 10-inch Brick Wall Hollow | 12-inch Brick Wall Solid | Stucco on Hollow Block | Brick Veneer on Hollow Block | Stucco on Frame | Brick Veneer on Boarding | Brick Veneer on Studding |
| Bid No. 1 | .0 | | 12.5 | | 10.2 | 15.5 | 1.9 | 5.9 | 5.2 |
| Bid No. 2 | .0 | 2.1 | 8.0 | 13.9 | 4.1 | 8.4 | 2.8 | 8.2 | 6.9 |
| Bid No. 3 | .0 | 1.4 | 6.4 | 10.8 | 7.3 | 8.2 | 2.3 | 4.2 | 3.0 |
| Bid No. 4 | .0 | | 12.0 | 16.6 | 7.7 | 14.3 | 4.6 | 12.0 | 10.9 |
| Bid No. 5 | .0 | .0 | 6.6 | 10.6 | 2.7 | 7.2 | 2.7 | 4.6 | 3.5 |
| Average of Bids | .0 | 1.6 | 9.1 | 13.0 | 6.3 | 10.7 | 2.9 | 6.9 | 5.8 |

In presenting the bids Mr. Fiske said: "As might be expected, a considerable variation appears among the figures submitted by the different contractors. No two contractors, even of equal skill and experience, will figure exactly the same cost on a given set of plans and specifications. Elements of chance must be considered, such as fluctuations in the market price of material and labor, weather conditions, and unexpected difficulties in construction. Moreover, each man's figure will be influenced to some extent by the measure of his desire to secure the contract in question; in fact, it is doubtful if the same contractor would bid exactly the same on different occasions, even for precisely the same structure. Moreover, if these variations are encountered in obtaining the cost of a given building in a given place, still wider differences will arise in obtaining bids for different localities where the price of material and conditions of labor are different. For this reason a certain amount of discrepancy between different authorities must be accepted as inevitable, and must not be allowed to throw suspicion on the figures."

In order to arrive at some definite figure which would fairly and equitably set forth the difference in cost of these various types of construction, the general average of all five bids was taken, in addition to the two most favorable bidders as shown in the tables below:

COMPARATIVE BIDS.

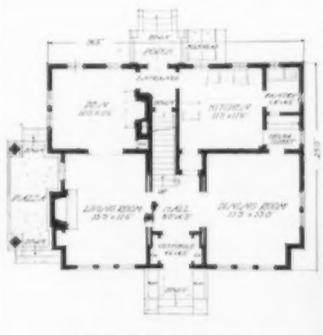
AVERAGE FIGURES.

| Type | Description | Average Bid | Excess Over Clapboards | Percentage Excess Over Clapboards |
|---|---|---|---|---|
| No. 1 | Clapboard | $6,759.95 | | |
| No. 2 | Shingle | 6,868.80 | $108.85 | 1.6 |
| No. 3 | 10-inch Brick Wall — Hollow | 7,372.48 | 612.53 | 9.1 |
| No. 4 | 12-inch Brick Wall — Solid | 7,641.00 | 881.05 | 13.0 |
| No. 5 | Stucco on Hollow Block | 7,187.65 | 427.70 | 6.3 |
| No. 6 | Brick Veneer on Hollow Block | 7,483.16 | 723.21 | 10.7 |
| No. 7 | Stucco on Frame | 6,952.90 | 192.95 | 2.9 |
| No. 8 | Brick Veneer on Boarding | 7,226.44 | 466.49 | 6.9 |
| No. 9 | Brick Veneer on Studding | 7,153.98 | 394.03 | 5.8 |

COMPARATIVE BIDS.

AVERAGE OF THE TWO MOST FAVORABLE BIDS.

| Type No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Description | Clapboard | Shingle | 10-inch Brick Wall Hollow | 12-inch Brick Wall Solid | Stucco on Hollow Block | Brick Veneer on Hollow Block | Stucco on Frame | Brick Veneer on Boarding | Brick Veneer on Studding |
| No. 3 | $6,692.00 | $6,786.00 | $7,118.00 | $7,418.00 | $7,179.00 | $7,238.00 | $6,847.50 | $6,970.00 | $6,895.00 |
| No. 5 | 7,450.00 | 7,450.00 | 7,940.00 | 8,240.00 | 7,650.00 | 7,990.00 | 7,650.00 | 7,790.00 | 7,710.00 |
| Average | 7,071.00 | 7,118.00 | 7,529.00 | 7,829.00 | 7,414.50 | 7,614.00 | 7,248.75 | 7,380.00 | 7,302.50 |
| Excess Over Clapb'ds | | 47.00 | 458.00 | 758.00 | 343.50 | 543.00 | 177.75 | 309.00 | 231.50 |
| Per cent Excess Over Clapb'ds | | .7% | 6.5% | 10.7% | 4.9% | 7.7% | 2.5% | 4.4% | 3.3% |



FIRST FLOOR PLAN.

HOUSE AT BEVERLY FARMS, MASS.

SECOND FLOOR PLAN.

Mr. Fiske in speaking of the two most favorable bids says: —

"The two concerns referred to in the last table were very well prepared to make an accurate comparison on this particular kind of building. Mr. Joslin, of the McDonald & Joslin Company, has made a thorough study of estimating different types of small and moderate-sized buildings, and is a well-known authority on the subject. Mr. Donaldson has made a specialty of all kinds of small house construction for many years. Their figures, like all the others, were prepared absolutely independently, and while they vary considerably in the totals, their percentage difference between the different types is in remarkably close agreement."

In making up his figures, Mr. Joslin used the following:

PRICE OF MATERIALS.

| | |
|---|---|
| Lime | $1.00 per bbl., 200 lbs. |
| Portland Cement | $1.60 per bbl. |
| Spruce Framing | $26.00 per M. ft. B. M. |
| North Carolina Pine | 1c. per inch per ft. |
| Georgia Matched Pine (first quality) | $75.00 per M. ft. B. M. |
| Shingles | $4.75 per M. |
| Clapboards | $55.00 per M. |
| Hemlock Boarding | $22.00 per M. ft. B. M. |
| 6-inch Hollow Blocks | 10½c. per sq. ft. |
| 8-inch Hollow Blocks | 14c. per sq. ft. |
| Face Brick | $17.50 per M. |
| Common Brick | $9.00 per M. |
| Allowance for Furring, Lathing, and Plastering | 5c. per sq. ft. |
| Wages of Bricklayers | 60c. per hour. |
| Wages of Carpenters | 50c. per hour. |

The cost of lumber displaced by brick on Types 3, 4, 5 and 6, would be as follows:

| | |
|---|---|
| Frame and Studding, 2,300 ft. B. M., @ $26.00 per M. | $59.80 |
| Square Edge Boards, 2,500 ft. B. M., @ $22.00 per M. | 55.00 |
| Spruce Clapboards, requiring for manufacture 600 ft. of stock, B. M. | 93.50 |
| Total, 5,400 ft. B. M. | $208.30 |

These figures may be used in comparison with prices of similar materials and labor in other markets, and by adjusting the differences they could be made applicable in all sections of the country.

# Plate Illustrations—Description.

THREE NEW SCHOOLS, ST. LOUIS, MO. PLATES 29, 30 AND 31. The new Carr School cost exclusive of building site and equipment $113,400 or 20.67 cents per cubic foot. The new Lyon School cost exclusive of building site and equipment $131,692 or 23.80 cents per cubic foot. The new Humboldt School cost exclusive of building site and equipment $176,832 or 16.95 cents per cubic foot.

WESTWOOD SCHOOL, CINCINNATI, OHIO. PLATES 33, 34. The exterior of this building is finished with a reddish brown, wire-cut brick, laid in a light gray mortar. All the trimmings are terra cotta, the color of which is a trifle more yellow than buff Bedford. The panel over the main entrance is executed in rich brown, green and buff, and the iron grilles are finished in green. The location of this school being five miles from the business center of the city, and so far removed from the central library and gymnasium, it was necessary to make the library in the school building of sufficient size to be used as a branch library, and at the same time increase the size of the gymnasium. The auditorium will be used for semi-public gatherings as well as an assembling place for the village. The total cost of the building, including equipment, heating, ventilating, etc., was approximately $197,950, making the price per cubic foot 17.5 cents.

LINCOLN SCHOOL, LINCOLN, MASS. PLATE 32. This school, which was built for children of the lower and middle grades, contains six class rooms, teachers', superintendent's and play rooms. The building is built of water-struck brick with wood and marble trim and slate roof. Upon the interior the finish is of hard wood throughout and stairs of iron. All the class rooms are on the south side. The ventilating ducts are all gathered together in the roof space and brought out through the cupola in contrast to the usual system which necessitates ventilators coming up through the roof. The grade drops sharply on the south side permitting of basement entrances for boys and girls at grade, and light for the play rooms. The cost per cubic foot of this building complete, including ventilating apparatus, plumbing, etc., but exclusive of architects' fees was 19.4 cents.

CHURCH OF ST. JOHN, KINGSBRIDGE, NEW YORK CITY. PLATES 39, 40. The foundations for the nave of this church were built some fifteen years ago for a small church with a seating capacity of six hundred. It was designed in the Romanesque style with nave and aisles, corner tower, etc. The foundations were roofed over and the basement used for church purposes, until the demands of the parish required an edifice, capable of seating one thousand people. The old foundation extended to about the point where the present transepts start. The new building starting from this point included the transepts and sanctuary from the foundations. The treatment of the exterior design was therefore established as to the window spacing and entrances. A distinctive feature of the plan is that there are no interior columns or piers. The foundations are built of granite, the water table and all other trimmings and tracery are of mat glazed white terra cotta. The face brick are 3 by 12 inches impervious, light buff, laid with ¼ inch white joints and the roof is laid with green slate. The decorative panels in front are of faience, while the entrance steps and cheeks are of gray Tennessee marble with a honed finish. The building as described above cost approximately $100,000.

TANNERS NATIONAL BANK, CATSKILL, N.Y. PLATES 41, 42. The exterior of this building is of Vermont marble on the street and alley façades while the rear extension and storage loft are of pressed brick. This bank was originally organized for the convenience of the tanning trade which accounts for the head of a steer appearing above the key-stone and in one of the medallions. The building is of fireproof construction throughout, the floor and roof slabs being supported upon steel construction. The main banking room is 27 feet from the floor to the under side of the lower skylight, which is glazed with No. 01 glass giving a diffused light throughout. The flooring

is of gray Knoxville marble tile and the wainscoting and counterscreen of pink Knoxville with a honed finish. The upper portion of the counterscreen is of mahogany, the walls are finished in plaster painted a delicate shade of French gray, and the ornaments including the enriched cornice and coffered ceiling are finished in gold. The clock above the vault is an example of Louis XVI work formerly in the New York State Capitol building. The cost of the building was as follows: General construction, $31,153.07; vault, $7,000; iron grille, $325; interior wall decorations, $1,300; metal furniture, $1,300; customers' desks and grilles, $543; clock, $150; electric clock attachment, $20.84; and electric lighting fixtures, $495.75. The total cost amounted to $42,300. The cubical contents estimated from the under side of the floor slab in the basement to the upper side of the roof slabs is approximately 95,000 cubic feet, which gives a cost per cubic foot of 44.5 cents.

# Editorial Comment and Miscellany.

## TUBERCULOSIS ASSOCIATION.

THE Boston Association for the Relief and Control of Tuberculosis should be commended in their efforts to prove the great advantage of fresh air as a factor in health. The association assumes that it is within the power of most architects, as well as their duty, to encourage life in the open with the maximum of time spent in the fresh air. They claim that there is and should be an increasing demand for open sleeping porches, balconies and roof spaces. They urge that in constructing stores, shops and mercantile establishments owners should be persuaded to provide open air accommodations for noon luncheons and recreation. The roof is the most available spot for these resting places. It could easily be turned into open air rests at little expense and with their wide commanding views and abundance of fresh air would eventually pay for themselves in the increased efficiency of the force using them. They cite the remarkable results obtained in open air schools for anæmic and tubercular children, with a demand for open air rooms, having at least one end that can be thrown entirely open. In constructing new school buildings they show how the roof may be used for both teaching and recreation purposes, removed as it is from the dusty, dirty, and noisy streets. This work, is being urged upon all members of the architectural profession.

DETAIL FOR FIFTH WARD SCHOOL, ATLANTA, GA.
Executed by the Atlanta Terra Cotta Company.
W. A. Edwards, Architect.

## CATHEDRAL IN MARBLE.

A GOTHIC cathedral of white marble is being erected in the city of Buffalo from designs of Aristides Leonori, the church architect of Rome. The cathedral will be 250 feet in length, the nave 100 feet in width and the transepts 150 feet. The height of the edifice will be 100 feet with its two towers having an additional height of 150 feet. The marble walls of the exterior will be tooled, while the interior walls and marble pillars will be polished. When completed the cathedral will contain seven marble altars and pews together with other furnishings in harmony with the architectural treatment. The estimated cost of the structure is $500,000 exclusive of furnishings.

DETAIL BY THE NEW JERSEY TERRA COTTA COMPANY.
Warren & Wetmore, Architects.

## CONGRESS OF TECHNOLOGY.

THE Congress of Technology will be held in Boston, April 10th and 11th of this year. The first of these dates is the fiftieth anniversary of the chartering of the Massachusetts Institute of Technology, and the primary purpose of the Congress is fittingly to mark that anniversary. A large number of Technology graduates who have been conspicuously successful in varied lines of engineering will present papers at the Congress, dealing with various aspects of the country's manifold industrial problems and treating of those problems not only as they exist now but as they promise to take different shape in the future. The whole body of papers will therefore constitute a survey of engineering

DETAIL FOR PUBLIC SCHOOLS NUMBERS 34 AND 35, JERSEY CITY, N. J.
Executed by the South Amboy Terra Cotta Company.
Rowland & Eurich, Architects.

and industrial science as a whole, from a body of men who speak from first-hand experience with industrial problems all over the country.

DETAIL EXECUTED BY THE O. W. KETCHAM TERRA COTTA WORKS.

## FIFTH AVENUE, NEW YORK CITY.

THE committee appointed to advise the Fifth Avenue Association in its effort to make this thoroughfare as pleasing to New York as any avenue in the world has recommended that the Borough President be granted supervisory powers by legislative action. In connection with this conclusion arrived at by the three architects, William M. Kendall, Arnold W. Brunner and the late John M. Carrère who served on the committee, a memorandum was also submitted. The memorandum, while it commends a rivalry in the beauty and character of the various buildings, urges that it be kept in due subordination to the rest of the block as a whole in order to preserve a generally satisfactory appearance. The thought is expressed that the present blocks contain too many separate units, most of which are vertical in their main effect, and that this could be overcome by carrying through strong horizontal courses and by harmony of color. Such a result could be realized only through the willingness of architect and owner to yield their individual interests for the benefit of the whole.

## PLANS FOR THE NEW YORK CENTRAL RAILWAY STATION.

PLANS for the main section of the new Grand Central Station by Reed & Stem and Warren & Wetmore, architects, were filed with the Building Department, New York City, January 13th. The new station will occupy the plot facing 42d street on which the old station stood. The main façade will be of brick, granite and limestone. The building will be set back several feet, in order to accommodate a large plaza approach. A distinctive feature will be the continuation of Park avenue over 42d street by means of a viaduct similar in design to one of the bridges in Paris. The cost of this building is estimated at $4,000,000.


STORE AND APARTMENT BUILDING, WASHINGTON, D. C.
Exterior of "Tapestry" brick made by Fiske & Co., Inc.
A. B. Heaton, Architect.

## AMERICAN ACADEMY IN ROME.

THE American Academy will soon be transferred from its present home, the Villa Mirafiore, to the Villa Aurelia. The new quarters which were left to the Academy by the late Mrs. C. J. Hayland are situated on the top of the Janiculum Hill.

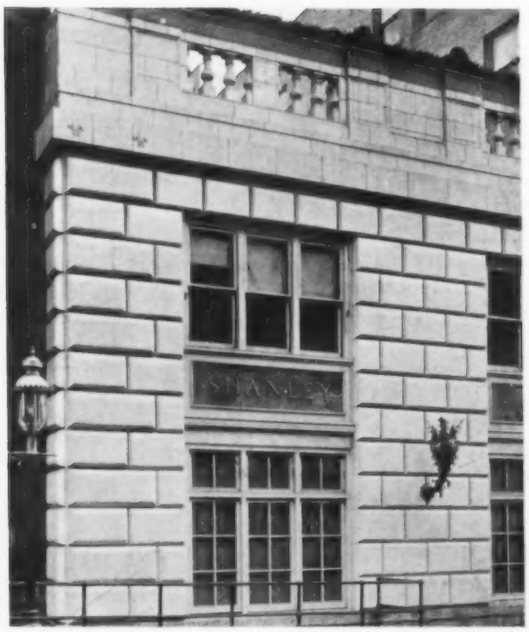
## ROTCH TRAVELING SCHOLARSHIP.

THE preliminary examinations for the Rotch Traveling Scholarship will be held at the office of the Secretary, C. H. Blackall, 20 Beacon street, Boston, on Monday and Tuesday, April 10th and 11th, to be followed by the sketch for competition in design on Saturday, April 15th. The successful candidate receives $2,000, to be expended in foreign travel and study during two years. Candidates must be under thirty years of age, and must have been engaged in professional work during two years in the employ of a practising architect resident in Massachusetts.

DETAIL FOR HEARST BUILDING.
Executed in polychrome enamel terra cotta by Northwestern Terra Cotta Company.
James C. Green, Architect.

## PRIZES AWARDED IN BUILDING TRADES EMPLOYERS' ASSOCIATION COMPETITION.

THE awards in the small house competition conducted by the B. T. E. A. are as follows: $4,500 House — First prize, Stephen Goossen, Detroit; Second prize, William J. Ryder, Philadelphia; Third prize, James W. O'Connor, New York City. $2,500 House — First prize, Robert L. Stevenson, New York City; Second prize, C. Mink and L. A. Carson, New York City; Third prize,



EXTERIOR DETAIL OF PUTNAM BUILDING, TIMES SQUARE, NEW YORK CITY.
Terra cotta furnished by the Atlantic Terra Cotta Company.
Charles A. Platt, Architect.

Norman B. Baker, Troy, N. Y. The committee judging the contest were William A. Boring, Donn Barber and Grosvenor Atterbury.

APARTMENT HOTEL, CENTRAL PARK, WEST, NEW YORK.
Terra cotta furnished by the New York Architectural Terra Cotta Company.
Mulliken & Moeller, Architects.

## LEBARRE PRIZE, PARIS.

FIRST place in the competition for the Lebarre prize in architecture at the École des Beaux Arts has been won by Ely J. Kahn, New York City. The problem was an immigration station and had to be finished in three days from the time of announcement. This is the first time that the honor has been brought to America and was won against seven hundred and fifty competitors. Mr. Kahn who is a student in the atelier of Redon will soon graduate from the École des Beaux Arts.

## $3,000,000 COLLEGE.

THE plans for the Graduate College at Princeton by Cram, Goodhue and Ferguson, architects, have been approved by the trustees of that university. The proposed group consists of the Thompson Graduate College, the Procter Memorial Dining Hall and the Cleveland Tower. The buildings which are to be completed by September, 1912, will be fireproof throughout and cost approximately $3,000,000.

## CROSBY HALL, LONDON.

CONSIDERABLE anxiety was felt when Crosby Hall, the last remaining specimen of a mediæval mansion of a London merchant, was torn down. But its individual stones were carefully numbered and the whole building has been re-erected on the north bank of the Thames at Chelsea. Not a single feature of the charming structure has been destroyed; the beautiful oriel window terminating in richly decorated stone vaulting and the old wooden roof over the main structure of the hall reappear as originally constructed. The hall stands clear of other buildings and shows its fine proportions to greater advantage than amid its former surroundings.

CARTOUCHE.
Made by American Terra Cotta & Ceramic Co.
Spier, Rohns & Gehrke, Architects.

## ANCIENT FRESCOES IN LOW AND HIGH RELIEF.

IN THE immediate vicinity of Pompeii recent excavations have disclosed a magnificent mansion containing more than twenty rooms, open air courts and enclosed gardens. The rooms are adorned in fresco paintings, intended to imitate sculpture both in low and high relief. Ionic columns have the appearance of being detached from the wall surface, while the interstices of painted grilles seem to be true perforations. Many of the frescoes contain imitations of ancient sculptures as well as architectural conceptions.

## NEW BOOKS.

ACADEMY ARCHITECTURE AND ARCHITECTURAL REVIEW. Second volume, 1910, edited by Alex. Koch, architect, and published at "Academy Architecture," 58 Theobald's Road, London. Agent for the United States, J. H. Jansen, Cleveland, Ohio.

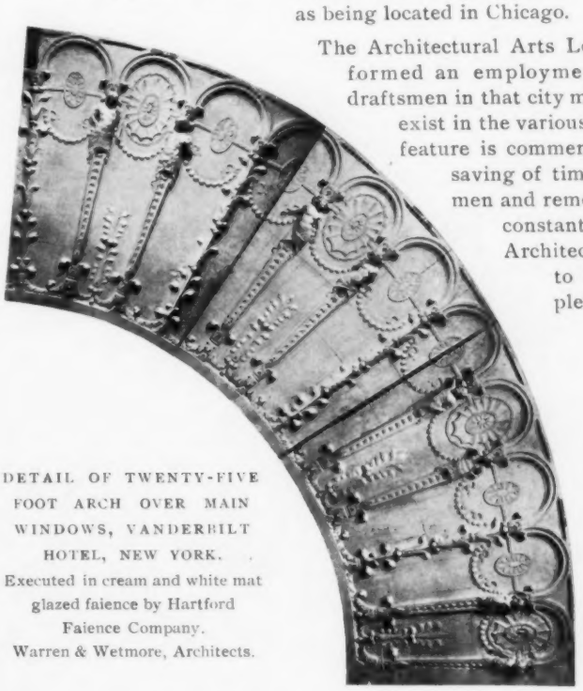
AMERICAN SCHOOL BUILDING STANDARDS. Wilbur T. Mills, architect. A book dealing with design, plan and equipment for schoolhouses. Columbus, Ohio, Franklin Educational Publishing Company.

GARAGES AND MOTOR BOAT HOUSES. Designs for private and commercial buildings by architects from different sections of the country, compiled by William Phillips Comstock. New York, The William T. Comstock Company. Price $2.00.

DETAIL FOR CONVENT.
Made by the Conkling-Armstrong Terra Cotta Company.
Charles R. Greco, Architect.

POPULAR HAND-BOOK FOR CEMENT AND CONCRETE USERS. Edited by Myron H. Lewis, C. E., and Albert H. Chandler, C. E. A reference book covering the uses of plain and reinforced concrete. New York, The Norman W. Henley Publishing Company. Price $2.50.

THE BEAUTIFUL NECESSITY, a book of Architectural Essays by Claude Bragdon. The book presents, in amplified form, those ideas on the subject of Architectural Æsthetics first treated of in Mr. Bragdon's address entitled *Mysticism and Architecture*, delivered at the third annual convention of the Architectural League of America, in Philadelphia, and again in his address entitled *Self Education*, given before the Boston Architectural Club, April 3, 1909. $2.00. The Manas Press, Rochester, N. Y.



DETAIL OF TWENTY-FIVE FOOT ARCH OVER MAIN WINDOWS, VANDERBILT HOTEL, NEW YORK.
Executed in cream and white mat glazed faience by Hartford Faience Company.
Warren & Wetmore, Architects.

## IN GENERAL.

Within a short time work will be started on three new high schools for San Francisco the total cost of which will be $1,300,000. Ground will first be broken for the new Lowell High School which will be built of brick and terra cotta, to accommodate forty rooms. The new Polytechnic High School to be erected will be a three-story brick and terra cotta building on a steel framework to include sixty rooms.

The University of Illinois announces a Fellowship in Architecture known as the Francis J. Plym Fellowship. The competition will be open to graduates of the Department of Architecture of that university. Full information may be obtained from Prof. Frederick M. Mann, Department of Architecture, University of Illinois, Urbana, Ill.

Charles Zeller Klauder has been admitted to the firm of Frank Miles Day and Brother, Philadelphia. The name of the newly constituted firm will be Day Brothers and Klauder.

D. J. Patterson, architect, has opened an office in the Mechanics Institute Building, San Francisco.

The Pfotenhauer-Nesbit Company of New York furnished Kittanning brick for the exterior of the new St. John's Church, Kingsbridge, New York, which is illustrated in this issue. Grueby Faience is also liberally employed in this building.

Robert C. Sweatt, architect of Spokane, Wash., has removed his offices to the Realty Building. Manufacturers' samples and catalogues desired.

The Soldan High School at St. Louis, William B. Ittner, architect, which was illustrated in THE BRICKBUILDER for February, was through a mistake mentioned as being located in Chicago.

The Architectural Arts League of Atlanta, Ga., has formed an employment bureau, in order that draftsmen in that city may ascertain what vacancies exist in the various architectural offices. This feature is commendable in that it is a great saving of time and expense to the draftsmen and removes from the architects the constant annoyance of applicants. Architects will apply for assistance to the bureau, where a complete list of men and their abilities will be kept on file.

The panel over the main entrance of the Westwood School, Cincinnati, Ohio, was executed by The Rookwood Pottery Company, the color scheme of which is a rich brown, green and buff.

San Antonio, Texas, is to have a twelve-story church and office building. The basement and first two stories will be used for ecclesiastical purposes and the other floors for business. The structure when completed will cost approximately $1,000,000.

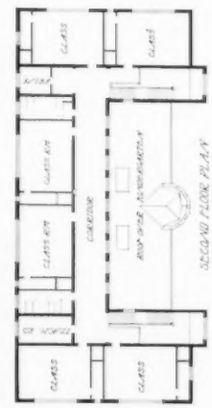
The Atlantic Terra Cotta Company furnished the architectural terra cotta used in the Westwood School, Cincinnati, Garber & Woodward, architects, and also for St. John's R. C. Church, Kingsbridge, New York, Davis, McGrath & Kiessling, architects. Both of these buildings are illustrated in this issue.

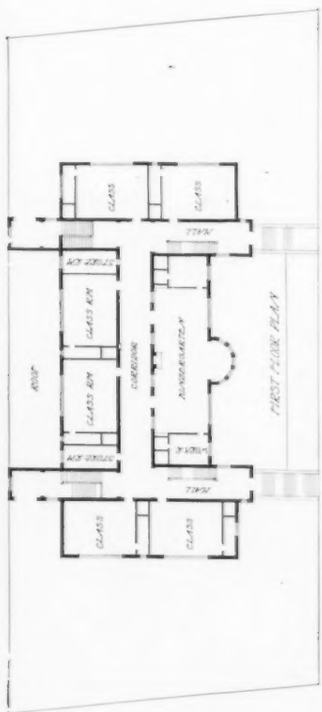
Architectural terra cotta for the following mentioned new buildings is being furnished by the Atlantic Terra Cotta Company: Third National Bank, Atlanta, Ga., W. T. Downing, Morgan E. Dillon and A. Ten Eyck Brown, associated, architects; Men's Dormitory, University of Wooster, Wooster, Ohio, L. C. Holden, architect; Church of the Sacred Heart, Taunton, Mass., Matthew Sullivan, architect; Imperial Life Building, Toronto, Canada, G. M. Miller & Co., architects.

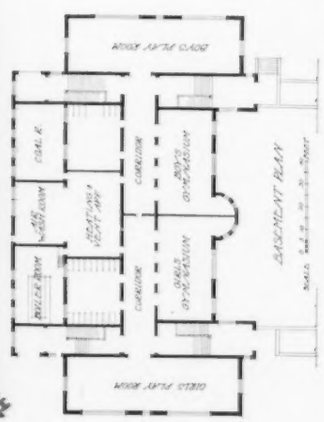
The brick used in the construction of the New Carr School, New Humboldt School and New Lyon School at St. Louis, Mo., illustrated in this issue, was furnished by the Hydraulic-Press Brick Company of St. Louis.



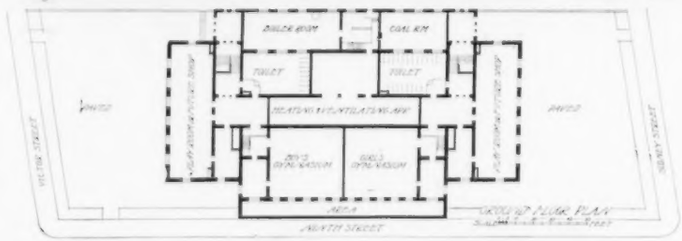

NEW CARR SCHOOL, ST. LOUIS, MO.
WILLIAM B. ITTNER, ARCHITECT.



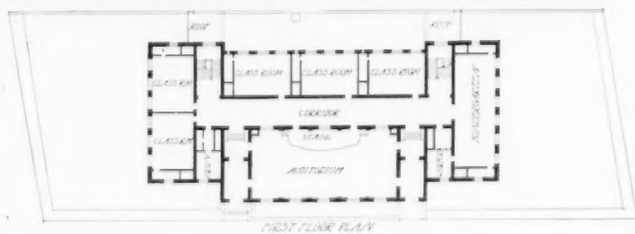


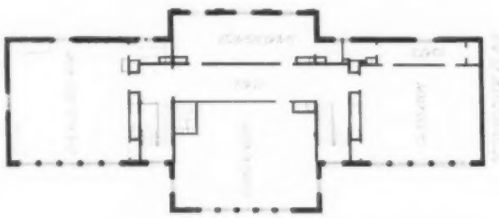


NEW LYON SCHOOL, ST. LOUIS, MO.
WILLIAM B. ITTNER, ARCHITECT.

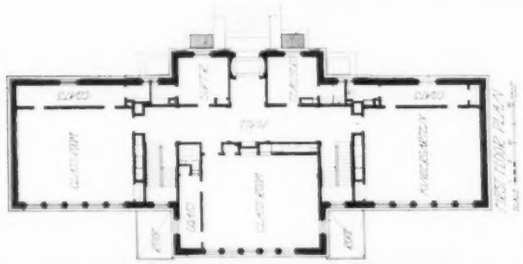


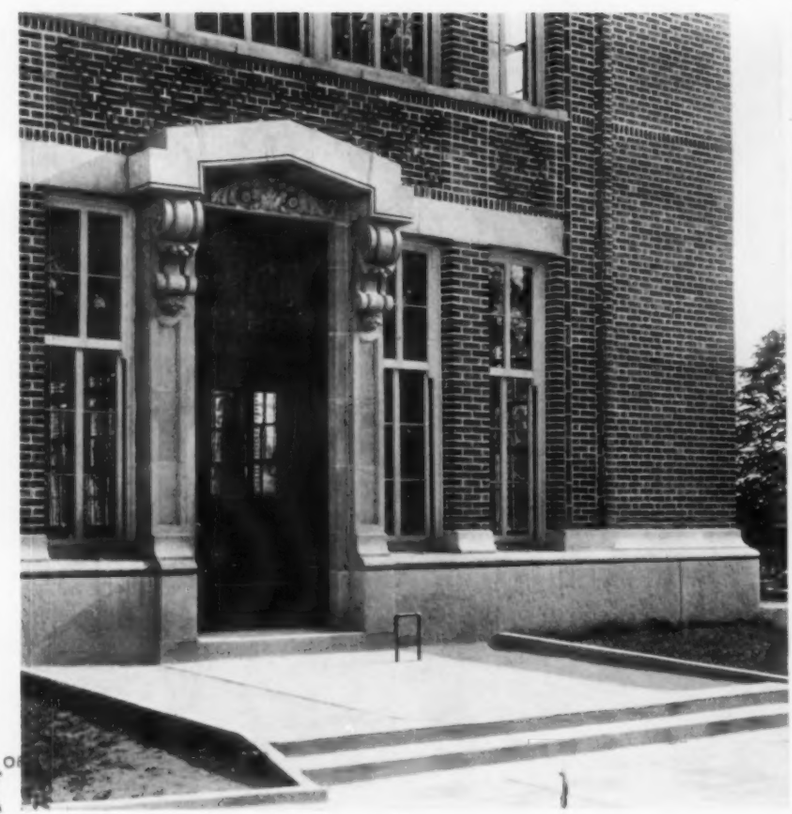

NEW HUMBOLDT SCHOOL,
ST. LOUIS, MO.
WILLIAM B. ITTNER,
ARCHITECT



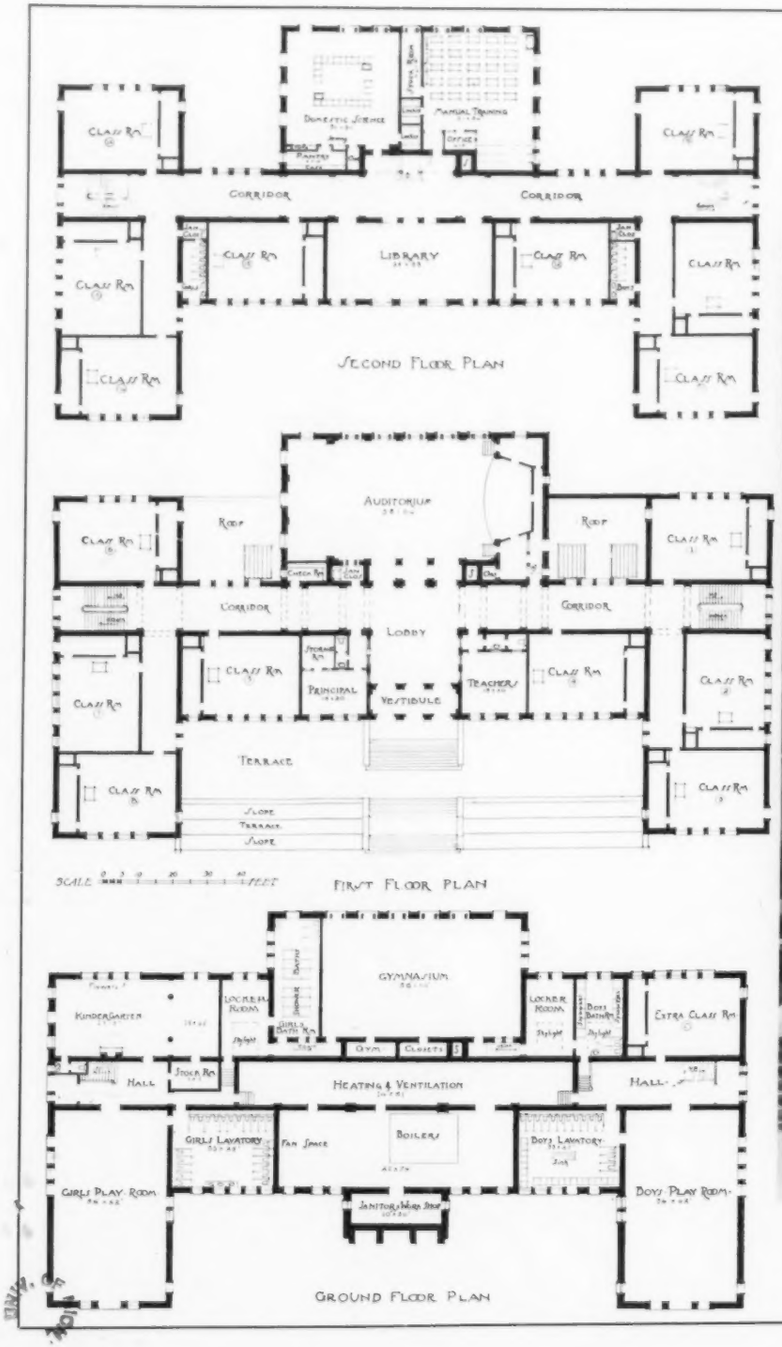


LINCOLN SCHOOL,
LINCOLN, MASS.
PARKER, THOMAS & RICE,
ARCHITECTS.

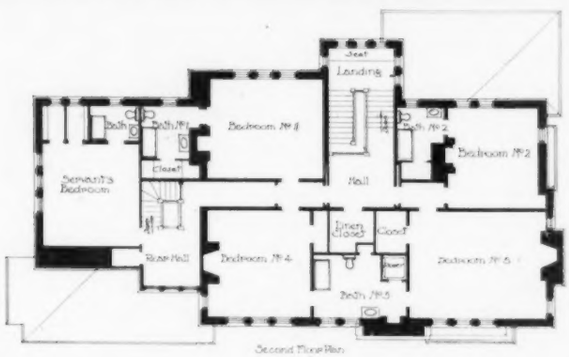




WESTWOOD SCHOOL, CINCINNATI, OHIO.
GARBER & WOODWARD, ARCHITECTS.




MAIN ENTRANCE, WESTWOOD SCHOOL, CINCINNATI, OHIO.
GARBER & WOODWARD, ARCHITECTS.




Second Floor Plan

## HOUSE AT PITTSBURG, PA.

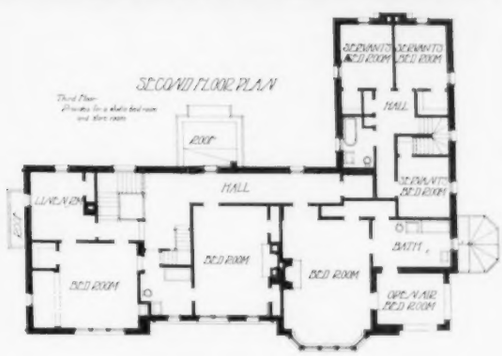
JANSSEN & ABBOTT, ARCHITECTS.


First Floor Plan
Scale 1/8"=1'0"


HOUSE AT PITTSBURG, PA.

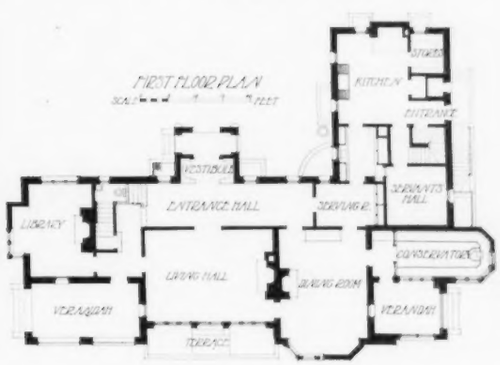
JANSSEN & ABBOTT, ARCHITECTS.

CONSERVATORY.

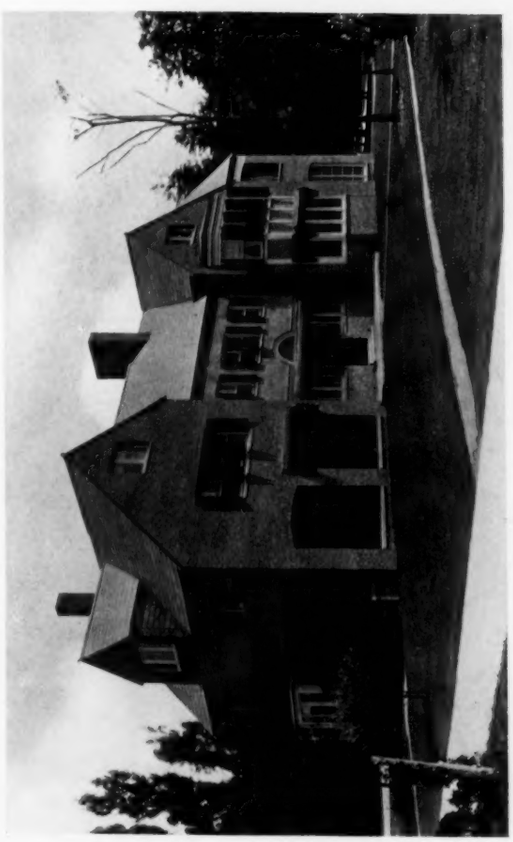


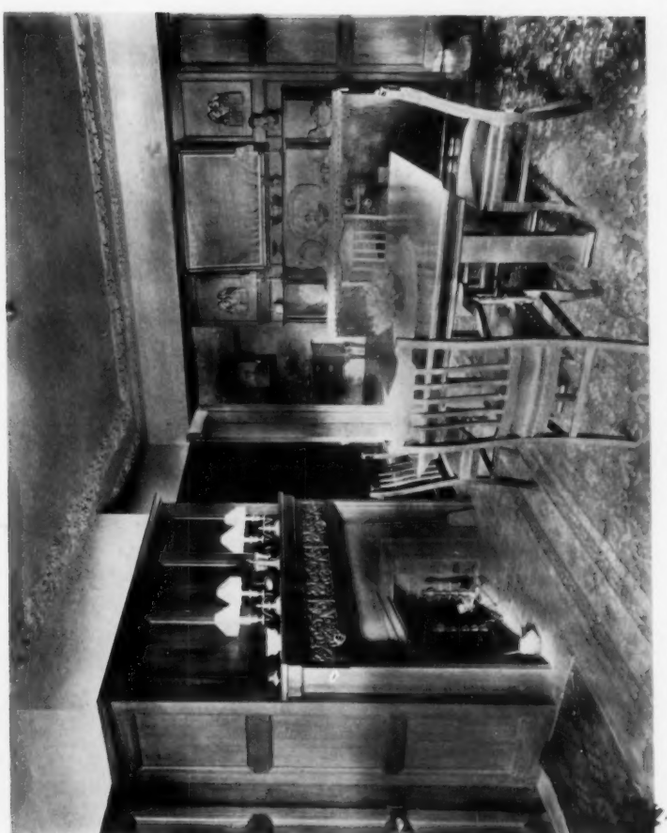

HOUSE AT WATERBURY, CONN.

CRAM, GOODHUE & FERGUSON,
ARCHITECTS.



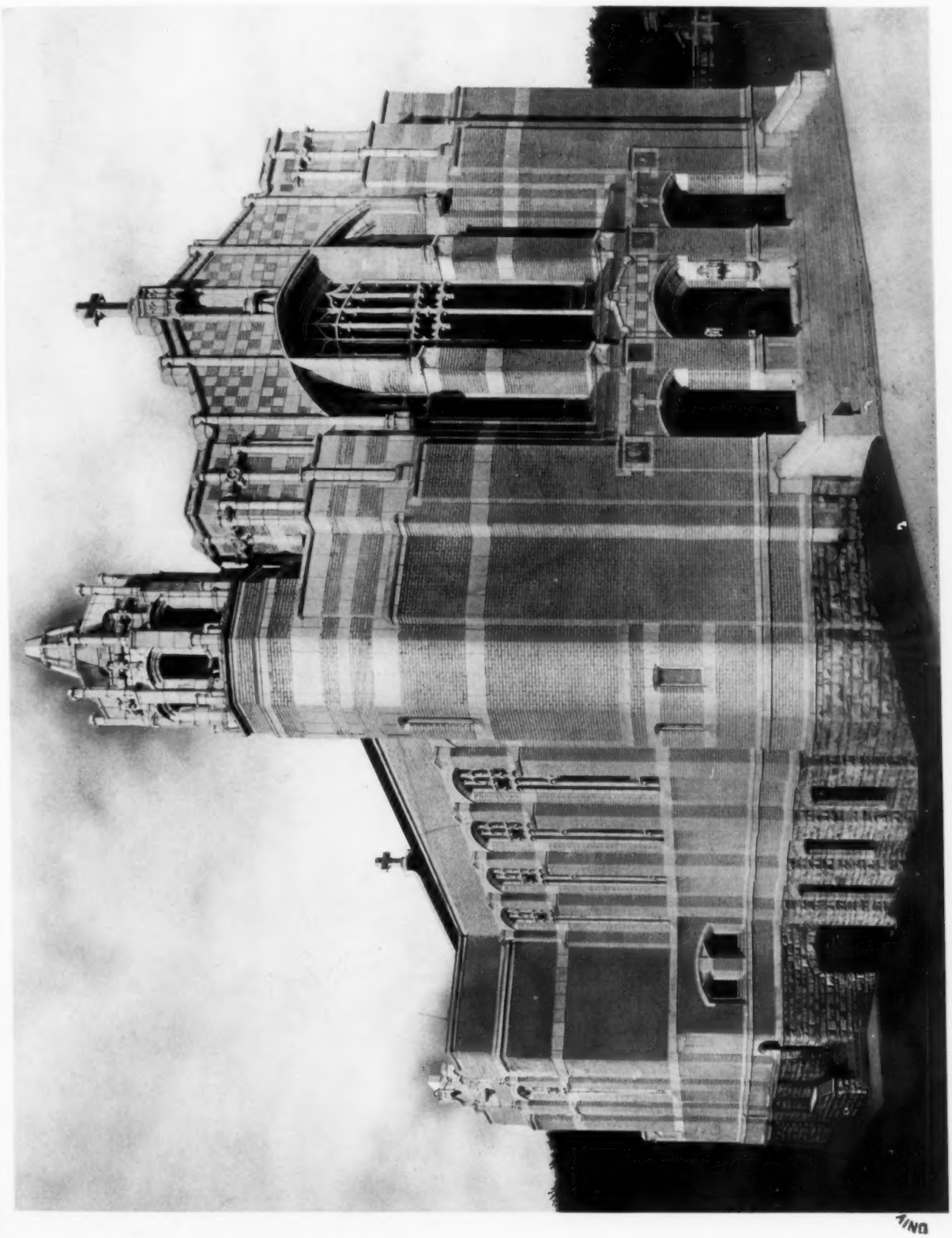
LIVING ROOM.



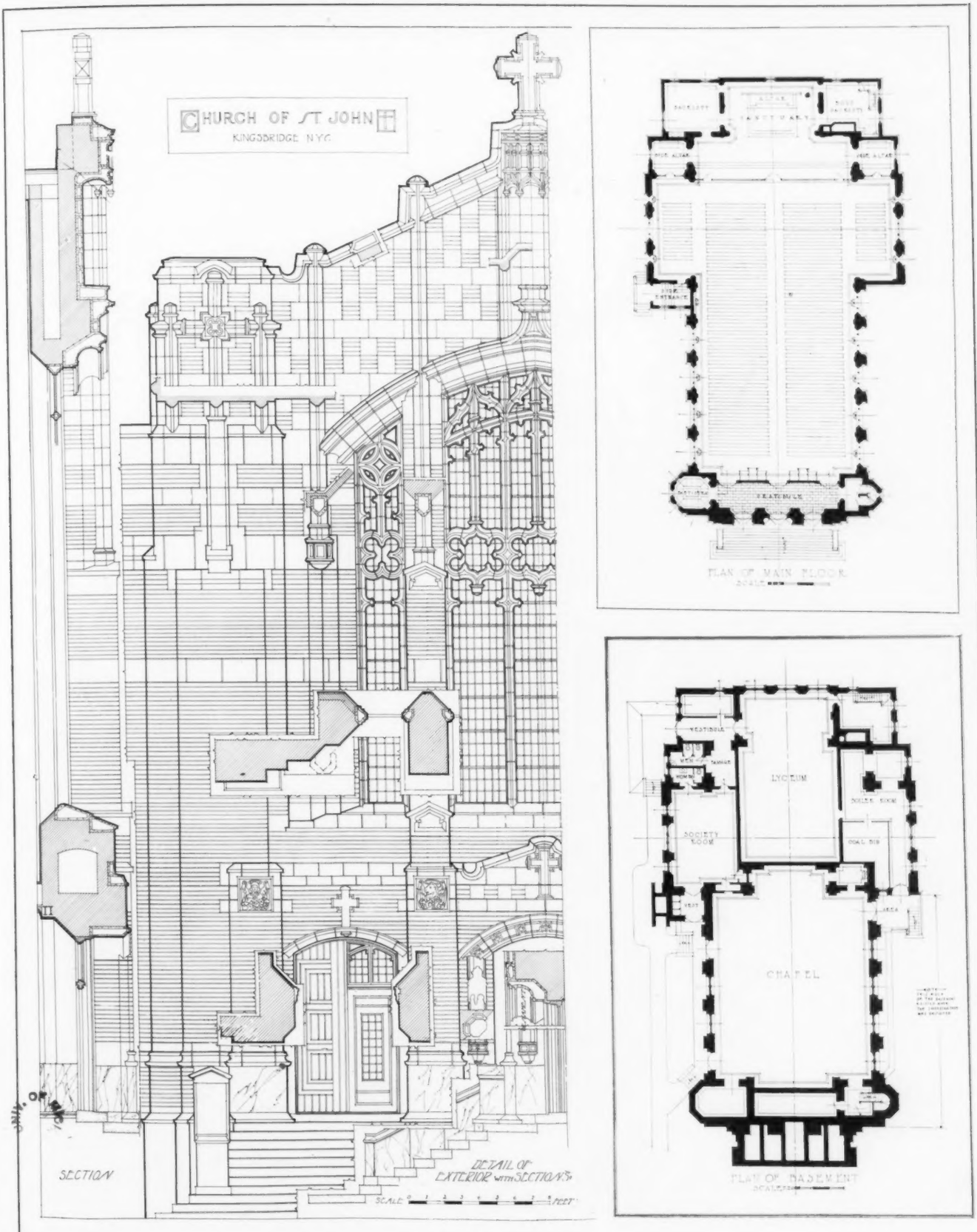


DINING ROOM.

HOUSE AT WATERBURY, CONN.
CRAM, GOODHUE & FERGUSON, ARCHITECTS.



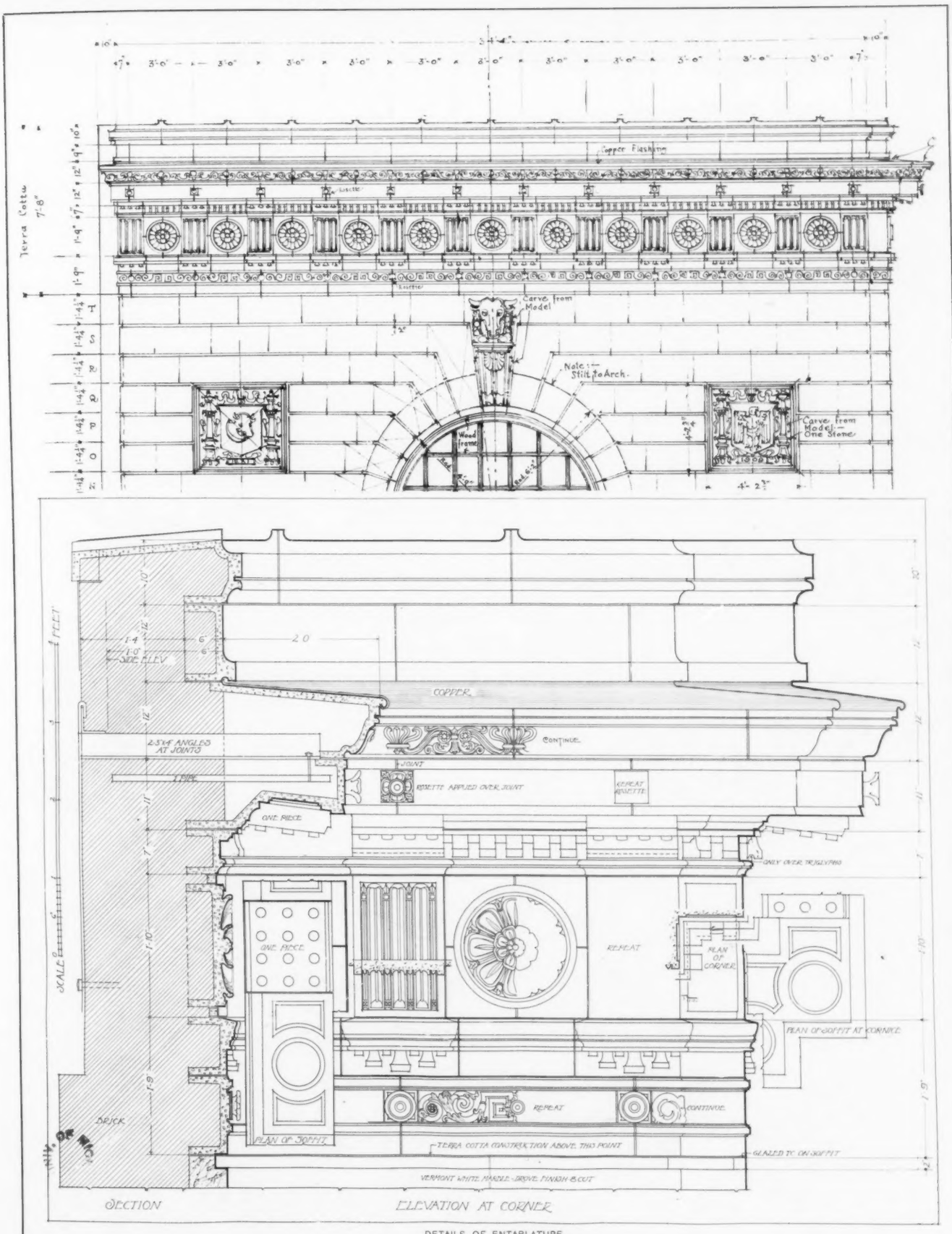
CHURCH OF ST. JOHN, KINGSBRIDGE, NEW YORK CITY.
DAVIS, McGRATH & KIESSLING, ARCHITECTS.




EXTERIOR DETAIL AND PLANS.

CHURCH OF ST. JOHN, KINGSBRIDGE, NEW YORK CITY.

DAVIS, MCGRATH & KIESSLING, ARCHITECTS.




DETAILS OF ENTABLATURE.

TANNERS NATIONAL BANK, CATSKILL, N. Y.

MARCUS T. REYNOLDS, ARCHITECT.